DOCUMENT RESUME

ED 182 186	SE 030 117

TITLE	Basic Instructional Technology. Staff Guide.
INSTITUTION	Development and Evaluation Associates, Washington, D.C.
SPONS AGENCY	Office of Water Program Operations (EPA), Cincinnati, Ohio. National Training and Operational Technology Center.
REPORT NO	EPA-430/1-79-009
PUB DATE	Nov 79
CONTRACT	68-03-2756
NOTE	338p.; For related documents, see SE 030 116-119
EDRS PRICE	MF01/PC14 Plus Postage.
DESCRIPTORS	Audiovisual Aids; Behavioral Objectives; Communication Skills; Instructional Staff; *Professional Development; Skill Development; Task Analysis; *Teaching Experience; *Training Techniques; Water Pollution Control

ABSTRACT

This staff guide is designed for personnel responsible for on-the-job training of work-related topics. Emphasis is given to the development of the basic skills of identifying instructional needs, specifying objectives, planning instruction, locating support materials, conducting instruction, and evaluating performance. Instructional activities include: lectures, guided discussions, demonstrations, individual assignments, and readings. The workshop consists of fourteen units which may be conducted on a variety of schedules. (CLS)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

United States
Environmental Protection
Agency

National Training
and Operational
Technology Center
Cincinnati OH 45268

EPA-430/1-79-009
November 1979

Water

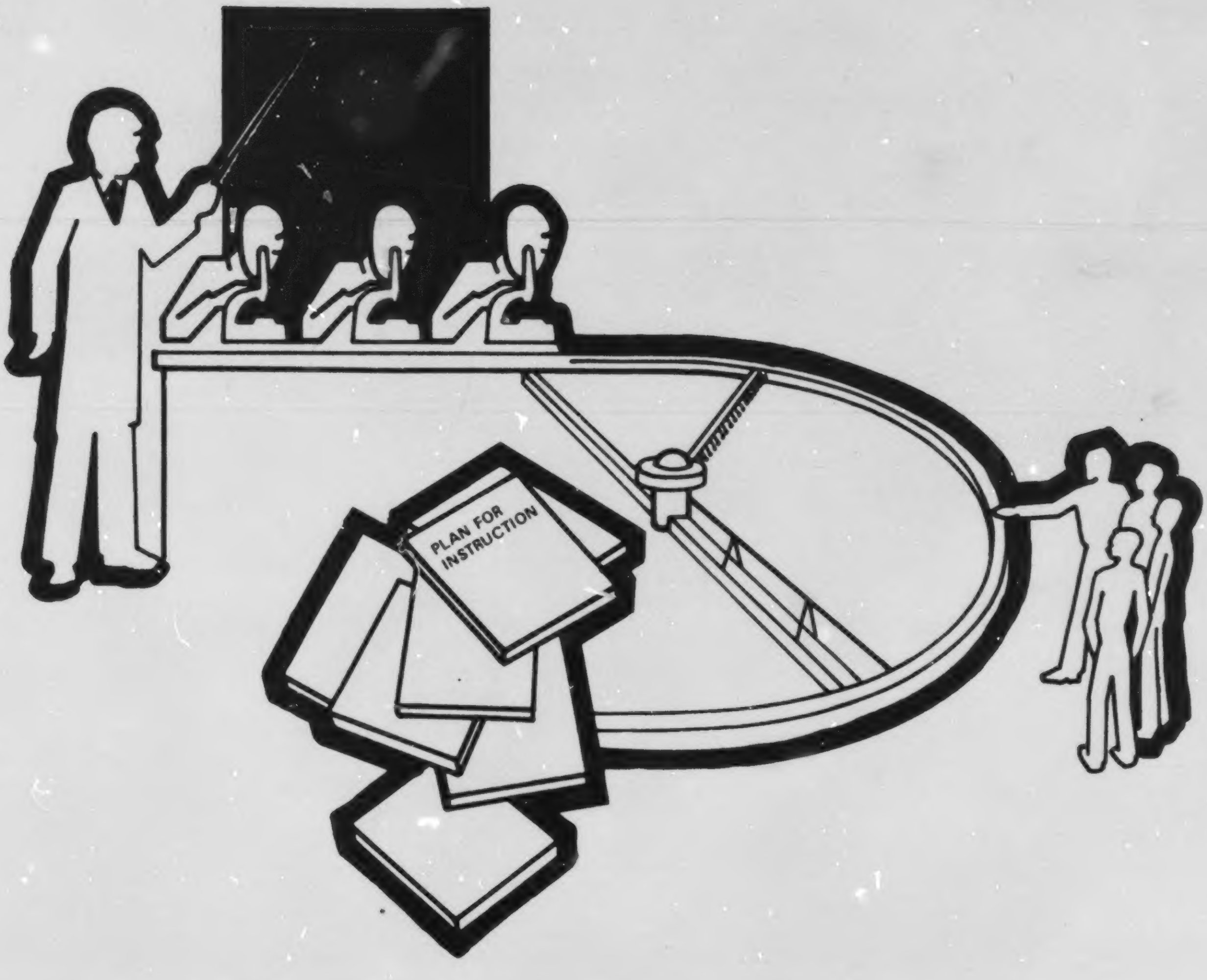
Basic Instructional Technology

Staff Guide

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED182186



SE 030 117

The mention of trade names or commercial products in this publication is for illustration purposes and does not constitute endorsement or recommendation for use by the U. S. Environmental Protection Agency.

Contents of this publication do not necessarily reflect the views and policies of the U. S Environmental Protection Agency.

Project Funded By

National Training and Operational Technology Center
United States Environmental Protection Agency
Cincinnati, Ohio 45268

Contract No. 68-03-2756

Project Officer: Mrs. Audrey D. Kroner

Awarded to:

Development and Evaluation Associates, Inc.
700 East Water Street
Syracuse, New York 13210

1/30/80

ERRATA

BASIC INSTRUCTIONAL TECHNOLOGY

STAFF GUIDE

In Unit Nine, the lessons for Unit Ten presentations are assigned. There is a list of the lessons in both Units Nine and Ten, with each lesson identified according to whether a participant or a workshop instructor is to present it. Please make the following corrections of the presenter for the cited lessons:

- Page 234, Lesson 12, "Media Selection," change "Participant Delivery" to "Given by instructor."
- Page 235, Lesson 15, "Community Resources," change "Participant Delivery" to "Given by instructor."
- Page 238, Lesson 14, "Introduction to Instructional Resources Center," change "Instructor" Lecture to "Participant" Lecture.
- Page 287, to the right of "Estimated time:15 minutes," change "Instructor" Presentation to "Participant" Presentation.

FOREWORD

In 1970, in response to an urgent need for instructors in wastewater treatment plant operations, the U.S. Environmental Protection Agency initiated an Instructor Training Program. The initial "Basic" course was developed by Kenneth M. Hay, Education Specialist in the Office of Water Programs. It was designed for persons experienced in plant operations who expected to be training others, but who had had no training in instructional methodology and techniques. Course content was continually reviewed and modified as needed, based on experience gained by its presentation to hundreds of novice trainers throughout the country. Some of the training materials were formalized (via a grant) into a staff guide to assist others in similar training efforts.

The Instructor Training Program was later expanded to include an "Advanced" workshop for individuals who had completed the Basic course and had some experience as instructors, but who needed more background and practice in developing instructional programs. Training materials were developed and several area workshops were conducted with grant funds.

In order to consolidate all the materials resulting from the extensive experience in offering this training, EPA's National Training and Operational Technology Center awarded a contract to Development and Evaluation Associates, Incorporated, of Syracuse, New York. The contractor revised, integrated, and expanded the existing materials to produce complete Staff Guides (including Transparency Masters), and Participant Reference Manuals for 1) a Basic Instructional Technology workshop and 2) an Advanced Instructional Technology workshop. The project was completed in September, 1979.

The materials are now available to assist others who are responsible for training environmental instructors in federal, state, and local programs. The format will enable them to use the materials as easily and effectively as possible in a wide variety of training situations. Persons interested in conducting the workshops can contact U.S. EPA-NTOTC, Cincinnati, Ohio, 45268, for information about obtaining copies of the manuals.

OTHER U.S. ENVIRONMENTAL PROTECTION AGENCY INSTRUCTIONAL SUPPORT SERVICES AND MATERIALS

INSTRUCTIONAL RESOURCES CENTER

The U.S. EPA National Training and Operational Technology Center (NTOTC) maintains an Instructional Resources Center in Cincinnati, Ohio. A primary objective is the compilation and dissemination of information about water quality and pesticide instructional materials available to interested persons. The "Instructional Resources Center Bulletin" is designed as the communications link between the Center and persons involved in environmental education and training. If you wish to receive free copies of the Bulletin, send your name, position title, organization or institution or agency name, mailing address and phone number to:

IRC Bulletin
U.S. EPA - NTOTC
Cincinnati, Ohio 45268

INSTRUCTIONAL MATERIALS CATALOG

Several audiovisual units and course packages are available for free loan from U.S. EPA's National Training and Operational Technology Center. The "Water Quality Control Instructional Materials" catalog describes slide/tape units, 16 mm films, videocassettes and course packages that can be borrowed. If you wish to obtain a free copy of the catalog, please send address information to:

Instructional Resources Center
U.S. EPA - NTOTC
Cincinnati, Ohio 45268

INSTRUCTIONAL RESOURCES INFORMATION SYSTEM

The Instructional Resources Information System (IRIS) is a computer-based information system. It currently lists information about 3000 printed or audiovisual water quality and pesticide instructional resources available from various individuals, state and federal government agencies, educational institutions and commercial companies throughout the country. For more information about this system, write to:

U.S. EPA Information Dissemination Project
Ohio State University
1200 Chambers Road
Columbus, Ohio 43212

INSTRUCTIONAL SUPPORT PACKAGES for TRAINING ENVIRONMENTAL PROFESSIONALS

The U.S. EPA National Training and Operational Technology Center (NTOTC) has developed instructional packages for several technical courses of interest to water, wastewater and land management personnel. Each package consists of a course manual, a staff guide and visual or audiovisual instructional aids for each topic. The printed manuals are available through EPA's Instructional Resource Information System (IRIS) and/or the National Technical Information Service (NTIS). Instructional aids for teaching the topics are available on free loan from EPA's NTOTC.

Following is a description of the courses for which instructional packages are currently available. The format of the manuals facilitates selection and presentation of those topics of interest to a particular student or group of students.

For more information about obtaining any of these materials, contact:

Instructional Resources Center
U.S. EPA - NTOTC
Cincinnati, Ohio 45268

Self-Monitoring Procedures: Basic Laboratory Skills

For: Treatment plant personnel who are required to monitor effluent discharges and who have had little or no previous experience in laboratory work.

Topics: Review of basic mathematics including the metric system, formulas and percentage; basic chemical laboratory operations such as weighing techniques, use of equipment and preparation or reagents; basic microbiological laboratory operations. Emphasis is on practice of skills.

Time: Seventeen lessons ranging from 0.5 to 3.0 hours. Total instruction time is about 38 hours.

Effluent Monitoring Procedures: Basic Parameters for Municipal Wastewaters

For: Municipal treatment plant personnel who are required to sample, measure and analyze their discharges and who have had little or no previous experience in laboratory work.

Topics: Open Channel Flow Measurements, Biochemical Oxygen Demand, Dissolved Oxygen, pH, Fecal Coliform by MPN and MF methods, Total Residual Chlorine, Suspended and Settleable Solids, Reporting Data. Emphasis is on laboratory practice.

Time: Eighteen lessons ranging from 0.5 to 7.5 hours. Total instruction time is 30 to 45 hours.

Effluent Monitoring Procedures: Metals Analyses

For: Municipal treatment plant personnel who are responsible for performing metal analyses and have had little or no experience in laboratory work.

Topics: Various metals are used as examples of six methods used to determine metals: Boron, colorimetry; Calcium, volumetric; Copper, Magnesium, Manganese, Zinc, direct aspiration atomic absorption; Lead, extraction followed by atomic absorption; Mercury, flameless atomic absorption; Potassium and Sodium, flame photometry. Emphasis is on laboratory practice.

Time: Seven lessons ranging from 2.5 to 5 hours. Total instruction time is 20 to 23 hours.

Effluent Monitoring Procedures: Nutrients

For: Municipal treatment plant personnel who are responsible for performing nutrient analyses and who have had little or no experience in laboratory work.

Topics: Phosphorus, Kjeldahl Nitrogen, Ammonia, Organic Nitrogen (by difference), Nitrate and Nitrite Nitrogen by Cadmium Reduction. Also Chemical Oxygen Demand and Oil and Grease. Emphasis is on laboratory practice.

Time: Nine lessons ranging from 1.0 to 7.0 hours. Total instruction time is 27 to 33.5 hours.

Methods for Determination of Chemical Contaminants in Drinking Water

For: Chemists and technicians with little or no experience in chemical procedures required to monitor drinking water.

Topics: Sampling, Statistics, Quality Control, Safety, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Fluoride, Nitrate, Organics (chlorinated Hydrocarbons, chlorophenoxys, trihalomethanes), Chlorine and Turbidity. Representative methods can be selected for the laboratory practice sessions.

Time: Fourteen lessons ranging from 1.0 to 3.8 hours. Total instruction time is 26 to 49 hours.

Determination of Residual Chlorine and Turbidity in Drinking Water

For: Chemists and technicians with little or no experience in chemical procedures required to monitor drinking water.

Topics: Compliance Requirements, Total Residual Chlorine and Turbidity. Emphasis is on laboratory practice.

Time: Five lessons ranging from 0.75 to 1.5 hours. Total instruction time is 5 hours.

Inorganic Analyses in Water Quality Control Programs

For: Chemists and technicians with chemical laboratory experience, 1 year of college level inorganic chemistry and 1 semester of quantitative analysis (or equivalent).

Topics: Sample Handling, Compliance Methodology, Safety, Analytical Techniques, Volumetric Analysis, Precision, Accuracy, Quality Assurance Programs, Acidity and Alkalinity, Total Residual Chlorine, Fluoride, Hardness, Nitrate and Nitrite Nitrogen, Total Phosphorus, Total and Suspended Solids, Specific Conductance, Turbidity. Emphasis is on laboratory practice.

Time: Nineteen lessons ranging from 0.5 to 5.25 hours. Total instruction time is 30 hours.

Organic Analysis in Water Quality Control Programs

For: Chemists and technicians with chemical laboratory experience, 1 year of college level organic chemistry and one semester of quantitative analysis (or equivalent).

Topics: Sample Handling, Compliance Methodology, Safety, Control of Analytical Performance, Spectrophotometer and Calibration Graphs, Gas Chromatography, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand, Chlorinated Hydrocarbons, Total Organic Carbon, Total Kjeldahl and Organic Nitrogen, Oil and Grease, Phenolics, Polychlorinated Biphenyls, Surfactants. Emphasis is on laboratory practice.

Time: Twenty-one lessons ranging from0.5 to 5.25 hours. Total instruction time is 26 to 30 hours.

Bacteriological Methods in Water Quality Control Programs

For: Bacteriologists and technicians with bacteriological laboratory experience including sample inoculations, transfers, media preparation and handling, and related skills.

Topics: Compliance Methodology; Chlorine Determinations and Turbidity; Bacterial Indicators; Equipment, Media and Solutions, Sample Volumes, Sample Collection and Test Procedures for both the Multiple Dilution Tube (MPN) and Membrane Filter (MF) methods; Statistics and Geometric Means. Emphasis is on laboratory practice.

Time: Twenty-one lessons ranging from 0.75 to 4.0 hours. Total instruction time is 28.75 hours.

Land Application of Wastes

For: Engineers, scientists, waste management specialists and other professionals with at least the equivalent of an undergraduate degree in engineering, agriculture or a related discipline.

Topics: Course integrates pertinent information from sanitary and environmental engineering, agronomy, soil science, agricultural engineering, economics and law as applicable to utilizing land for the application of various types of wastes. Lessons are: Soil as a treatment medium, Site evaluation procedures, Design approaches, Social factors, Vegetative cover, Alternative systems, Monitoring, Nitrogen management, Phosphorus management, Toxic element interactions, Organics, Legal aspects, Crop selection, Non-crop uses, Costing procedure, Water management and climate effects.

Time: Twenty-one modules ranging from 0.5 to 3.0 hours. Designed for a workshop setting of about 40 hour duration.

Note: Materials were developed by a grantee.

Erosion and Sediment Control, Audiovisual Training Program

For: Those responsible for erosion and sediment control, management, inspections or State standard development or support.

Topics: Erosion and sediment control, Soils, Rainfall-runoff relationships, Erosion and sedimentation, Plant materials, Control of runoff during construction, Vegetative soil stabilization, Stream erosion control, Temporary soil stabilization, Sediment from construction, Control planning, Wooded sites, Roles and responsibilities.

Time: Thirteen modules, self-paced. The package is designed for both self-study and for group presentation.

Note: Materials were developed by a contractor.

CURRICULUM GUIDES

Curriculum guides for training water quality control personnel have been developed by various institutions and are available for use and adaptation by others. For further information about the following, contact the source cited.

A Two-Year Water Quality Monitoring Curriculum

Source: Ulster County Community College
Attn: Professor Richard Glazer's Office
Stone Ridge, New York 12484

Wastewater Technology: A Two-Year Post-High School Instructional Program

Source: Charles County Community College
Attn: Mr. William Engel's Office
P.O. Box 910
La Plata, Maryland 20646

Wastewater Engineering Technology Program

Source: Clemson University
Attn: Dr. Joseph Allen's Office
Clemson, South Carolina 29631

Note: This is a four year program.

Bachelor of Engineering Technology Curriculum in Water Quality Management

Source: Pennsylvania State University
Attn: Dr. Charles Cole's Office
Capitol Campus, W 261
Middletown, Pennsylvania 17057

Note: This is a two + two or a four year program.

CONTENTS

FOREWORD i

INTRODUCTION 1

DESCRIPTION OF WORKSHOP 1

SUMMARY PLAN OF INSTRUCTION 2

WORKSHOP SCHEDULE ALTERNATIVES 5

MILESTONES IN WORKSHOP PLANNING AND PREPARATION 9

Sample Letter to Participants 10
Pre-Workshop Survey 11

TRAINING RESOURCES 12

Instructional Staff 12
Facilities and Equipment 12
Materials 12

USING THIS STAFF GUIDE IN PLANNING AND CONDUCTING THE WORKSHOP 14

Unit Overviews 14
Lesson Instructional Package Worksheets 15
Support Materials 16

INDEX TO UNITS 17

UNITS OF INSTRUCTION

Unit One -Introduction 19
Unit Two -Problem Analysis 33
Unit Three -Task Analysis 63
Unit Four -Objectives Specification 97
Unit Five -Evaluation Techniques 119
Unit Six -Instructional Methods and Media 155
Unit Seven -Lesson Planning 183
Unit Eight -Developing Oral Communication Skills 215
Unit Nine -Development of First Presentations 231
Unit Ten -Instructional Media and Related Resources 237
Unit Eleven -Classroom Management 295
Unit Twelve -Development of Second Presentations 309
Unit Thirteen -Workshop Summary 313
Unit Fourteen -Evaluation and Conclusion 315

REFERENCES 319

BASIC INSTRUCTIONAL TECHNOLOGY

INTRODUCTION

As part of the overall goal of EPA to help provide environmental professionals with the skills required to plan and deliver training programs, materials and guidelines have been developed for conducting a workshop in Basic Instructional Technology. The information is presented in two manuals, a Staff Guide and a Participant Reference Manual.

The Staff Guide is intended to be used by the instructor in planning and delivering the workshop. The Participant Reference Manual contains materials for student use during the workshop, and is also intended for use "on-the-job" in preparing future instructional activities.

To prepare for delivering this workshop, review all the materials in both manuals. Then, beginning with the Staff Guide section entitled "Workshop Plan and Schedule," proceed to make all the necessary decisions and preparations for delivering the workshop. Planning for this workshop should begin several months before its intended delivery.

DESCRIPTION OF WORKSHOP

The workshop consists of 14 units of instruction totaling approximately 40 hours of classroom time. It can be conducted on a variety of schedules ranging from five continuous days to several weekends or a series of half-days.

It is designed for supervisors and other personnel who are responsible for on-the-job training and/or brief seminars on work-related topics, but who have had little or no experience as instructors.

The emphasis of the workshop is on the development of the basic, practical skills of identifying instructional needs; specifying objectives; planning instruction; locating support materials; conducting instruction using various formats and effective speaking techniques; and finally, evaluating the performance of those who receive the instruction. Most of the content is treated on a strictly applied basis with a minimum of theory and technical explanation. The instructional activities include lectures, guided discussions, demonstrations, individual assignments and readings. A variety of instructional methods and media have been included in order to demonstrate the proper use of these techniques.

By the end of the workshop, the concepts and principles composing each topic will have been described and demonstrated and the participants will have practiced their application and received feedback on their performance.

SUMMARY PLAN OF INSTRUCTION

Unit of Instruction	Time	Method(s)	Content Outline
Unit One Introduction	2½ hours	-Lectures -Assignment	-Introduction to Workshop -Participant introductory presentations
Unit Two Problem Analysis	2 hours	-Lectures -Assignment	-Introduction to problem analysis -Categories of problems -Use of Problem Definition Worksheet
Unit Three Task Analysis	2½ hours	-Lecture -Demonstration -Assignments	-Introduction to job analysis and the use of Task Summary Sheet -Practice application
Unit Four Objectives Specification	4 hours (one hour may be done overnight)	-Lectures -Self-instruction -Guided discussion -Assignments	-Introduction to behavioral objectives and performance levels -Practice in writing objectives
Unit Five Evaluation Techniques	4 hours	-Lectures -Assignments	-Principles and concepts of evaluation -Constructing written tests -Evaluating job performance
Unit Six Instructional Methods and Media	3 hours	-Lectures -Demonstration -Guided discussion -Assignments	-Principles of learning -Rules for organizing instruction -Teaching techniques -The Instructional Methods Selection Table, Media Selection Table, and Lesson Planning Form

Unit of Instruction	Time	Method(s)	Content Outline
Unit Seven Lesson Planning	3½ hours	-Lectures -Demonstration -Assignment	-Process of lesson planning -Using the IPW
Unit Eight Developing Oral Communication Skills	2 hours	-Lecture -Demonstration -Participant presentations	-Characteristics of an effective oral presentation
Unit Nine Development of First Presentations	1½ hours (1 hour may be done overnight)	-Assignment	-Working from prepared IPWs for Unit Ten, each participant develops and practices a short presentation
Unit Ten Instructional Media and Related Resources	5½ hours	-Participant presentations -Self-instruction	-Characteristics of various media -Operation of equipment -Media selection -IRIS, IRC
Unit Eleven Classroom Management	1 hour	-Lecture -Guided discussion	-Physical and interpersonal environments and communication -Techniques for managing instruction and maintaining attention
Unit Twelve Development of Second Presentations	3 hours (2 hours may be done overnight)	-Assignment	-Working from their notes and lesson titles, participants prepare objectives, evaluation items, IPWs, and presentations for Unit Thirteen lessons
Unit Thirteen Workshop Summary	5 hours	-Participant presentations	-Workshop is summarized and reviewed through participant presentations -Participants receive feedback on quality of the preparation and presentation

Unit of Instruction	Time	Method(s)	Content Outline
Unit Fourteen Evaluation and Conclusion	1½ hours	-Assignment -Guided discussion	-Workshop participants complete and correct post-test -Participants evaluate workshop

WORKSHOP SCHEDULE ALTERNATIVES

The following schedules are provided as examples of how the workshop can be offered in five full days, over three weekends, or across twelve afternoons or evenings. The five day schedule is considered to be the most desirable in terms of instructional effectiveness and the attitudes of participants.

These schedules are intended only as suggestions to be modified to fit local circumstances. The workshop consists of 40 hours of instructional time. Time estimates are based on a workshop enrollment of twleve. If the workshop is larger or smaller, the estimated duration of the workshop may change accordingly.

Consider the following points in adapting the workshop schedule to local circumstances.

1. Present the workshop in as concentrated a fashion as possible. For example, presenting the workshop on three consecutive weekends is preferred over a schedule that would spread the workshop over several months.
2. Do not attempt to cover too much in a single day. The following schedules present the most concentrated feasible schedules. You should avoid planning for more than 7½ hours of instruction in a single day. Three and a half to four hours of instruction is the limit for an afternoon or evening session (unless it involves a lot of individual activity).
3. Use common sense in dividing units of instruction across two days. Do not subdivide lessons unless absolutely necessary. Only divide units at the lesson level where there is a logical break between lessons.
4. If the workshop is to be offered across a number of weeks, build in extra time at the beginning of each session to review what has already been covered.
5. Do not under any circumstances change the order in which the units are presented. They are designed to build upon one another in sequence.

The three sample schedules follow.

FIVE DAY SCHEDULE

			Hours:Min.
DAY ONE			
Morning	Unit One:	Introduction	2:30
	Unit Two:	Problem Analysis (Lesson 1, 2)	1:00
Afternoon	Unit Two:	Problem Analysis (Lesson 3)	1:00
	Unit Three:	Task Analysis	2:15
	Unit Four:	Objectives Specification (Lesson 1)	:45
Evening Assignment	Unit Four:	Objectives Specification (Lesson 2)	1:00
			8:30
DAY TWO			
Morning	Unit Four:	Objectives Specification (Lesson 2, 3)	2:15
	Unit Five:	Evaluation Techniques (Lesson 1)	1:30
Afternoon	Unit Five:	Evaluation Techniques (Lessons 2, 3)	2:30
	Unit Six:	Instructional Methods and Media (Lessons 2, 3)	1:15
			7:30
DAY THREE			
Morning	Unit Six:	Instructional Methods (Lessons 2, 3)	1:45
	Unit Seven:	Lesson Planning (Lessons 1, 2)	1:45
Afternoon	Unit Seven:	Lesson Planning (Lessons 3, 4, 5)	1:45
	Unit Eight:	Developing Oral Communication Skills	2:00
			7:15
DAY FOUR			
Morning	Unit Nine:	Development of First Presentations	1:30
	Unit Ten:	Instructional Media (Lessons 1-6)	2:15
Afternoon	Unit Ten:	Instructional Media (Lessons 7-15)	3:15
	Unit Eleven:	Classroom Management	1:00
Evening Assignment	Unit Twelve:	Development of Second Presentations	2:00
			10:00
DAY FIVE			
Morning	Unit Twelve:	Development of Second Presentations	1:00
	Unit Thirteen:	Workshop Summary	2:30
Afternoon	Unit Thirteen:	Workshop Summary	2:30
	Unit Fourteen:	Evaluation and Conclusion	1:30
			7:30

WEEKEND SCHEDULE

				Hours:Min.
WEEKEND I				
	DAY 1	Unit One:	Introduction	2:30
		Unit Two:	Problem Analysis	2:00
		Unit Three:	Task Analysis	2:15
		Unit Four:	Objectives Specification	:45
				7:30
	DAY 2	Unit Four:	Objectives Specification	3:15
		Unit Five:	Evaluation Techniques	4:00
				7:15
WEEKEND II				
	DAY 3	Unit Six:	Instructional Methods and Media	3:00
		Unit Seven:	Lesson Planning	3:30
				6:30
	DAY 4	Unit Eight:	Developing Oral Communication Skills	2:00
		Unit Nine:	Development of First Presentations	1:30
		Unit Ten:	Instructional Methods and Media Resources	4:00
				7:30
WEEKEND III				
	DAY 5	Unit Ten:	Instructional Methods and Media Resources	1:30
		Unit Eleven:	Classroom Management	1:00
		Unit Twelve:	Development of Second Presentations	3:00
				5:30
	DAY 6	Unit Thirteen:	Workshop Summary	5:00
		Unit Fourteen:	Evaluation and Conclusion	1:30
				6:30

EVENING/AFTERNOON SCHEDULE			Hours:Min.
ONE	Unit One:	Introduction	2:30
	Unit Two:	Problem Analysis (Lessons 1, 2)	1:00
TWO	Unit Two:	Problem Analysis (Lesson 3)	1:00
	Unit Three:	Task Analysis	2:15
THREE	Unit Four:	Objectives Specification	4:00
FOUR	Unit Five:	Evaluation Techniques	4:00
FIVE	Unit Six:	Instructional Methods (Lessons 2, 3)	3:00
SIX	Unit Seven:	Lesson Planning	3:30
SEVEN	Unit Eight:	Developing Oral Communication Skills	2:00
	Unit Nine:	Development of First Presentations	1:30
EIGHT	Unit Ten:	Instructional Media (Lessons 1-8)	2:50
NINE	Unit Ten:	Instructional Media (Lessons 9-15)	2:40
	Unit Eleven:	Classroom Management	1:00
TEN	Unit Twelve:	Development of Second Presentations	3:00
ELEVEN	Unit Thirteen:	Workshop Summary (Lessons 1-9)	3:45
TWELVE	Unit Thirteen:	Workshop Summary (Lessons 10-12)	1:15
	Unit Fourteen:	Evaluation and Conclusion	1:30

MILESTONES IN WORKSHOP PLANNING AND PREPARATION

Time in Weeks Prior to Workshop Delivery	Activity
Ten	Obtain complete copies of Staff Guide and Participant Reference Manual and review thoroughly.
Nine	Design workshop schedule, select dates and times, secure classroom/meeting space.
Eight	Announce workshop or otherwise establish procedures for determining the participants.
Seven	Check physical requirements for conducting workshop and make necessary arrangements, place orders, etc. - seating - water, coffee - ventilation, heat, light - overhead projector, screen - blackboard or easel - other audio-visual equipment for Unit Six - Xerox and Thermofax equipment - paper, pencils, etc.
Six	Prepare to conduct workshop by thoroughly reviewing the Instructional Package Worksheets (IPWs), Content Outlines, etc. Review the materials under "References" for additional help in unfamiliar areas.
Five	Obtain list of intended participants and send letter with Pre-Workshop Survey.
Four	Prepare the necessary copies of all instructional materials - Handouts - Participant Reference Manuals - Overhead transparencies
Three	Analyze Pre-Workshop Survey
Two	Prepare final notes for delivering each lesson. Determine the points to be emphasized, examples to be used, etc.
---	Begin workshop.

Sample Letter to Workshop Participants

Dear __________,

Welcome to the Basic Instructional Technology Workshop. The workshop will begin on (date) at (time). It will be held in/at (location--include map if necessary). A complete outline of the workshop's scheduled meeting dates and times is enclosed.

You will be one of _____ participants in the workshop. I will be your instructor and we will be using a specially designed set of materials from the Environmental Protection Agency's National Training and Operational Technology Center in Cincinnati, Ohio. The purpose of the workshop is to provide you with skills needed to plan and deliver effective training programs. Instructional activities will include lectures, discussions, assignments and practice sessions. As part of the workshop, you will receive a Reference Manual useful for planning and conducting your own training sessions in the future.

I am looking forward to conducting this workshop. To help my preparation for these sessions, I am interested in learning as much as possible about the backgrounds of the participants. With this information I will be able to adapt the instructional presentations to fit your backgrounds. Therefore, would you please take the time now to complete the enclosed survey and mail it to me in the stamped self-addressed envelope provided.

Thank you for helping me prepare for this workshop. I look forward to seeing you on the (date). If you have any particular questions before then, you can reach me at (phone number).

Sincerely,

Pre-Workshop Survey

Name ______________________ Occupation ______________________

1. Reason for taking this workshop:

2. Do you have any teaching experience? If so, please explain.

3. Do you know how to operate any audio-visual equipment? (16 mm motion picture projector, slide projector, etc.) If yes, which ones?

4. Have you ever developed instructional/training materials or designed a workshop? Please describe your experience in this area.

5. Have you ever created tests and rating scales or planned an evaluation of employee job performance?

6. What do you see as the most important training need in your work setting?

Thank you for your help.

TRAINING RESOURCES

Instructional Staff

This workshop is designed so that it may be conducted by one instructor working with 12 participants. However, given the rather intense instructional load and tight timelines, it would be highly advisable to have it conducted by two instructors working a a team-teaching arrangement. In order to maintain desired levels of feedback and individual assistance, a second instructor becomes a virtual necessity for workshop enrollments in excess of 12 participants.

The instructor of this workshop should be an experienced teacher or trainer with at least some limited familiarity with the activities and work settings of environmental personnel. Instructors are not expected or required to have any particular backgrounds in the theory and application of all the various instructional technology and evaluation subjects covered in the workshop. References are provided for specific subject areas (listed in each Unit Overview and at the conclusion of the Staff Guide) if the instructor desires to strengthen his/her preparation.

Facilities and Equipment

Minimum Requirements

1. A comfortable, well-lighted classroom area with tables or individual desks for the learners.

2. A chalkboard, overhead projector and screen, and lighting control equipment. (If the use of an overhead projector is an absolute impossibility, the figures intended as transparencies can be copied and used as handouts.)

3. A Xerox or Thermofax machine for making transparencies.

Recommended Additions

1. Additional nearby rooms or workspace of some kind in which small groups of participants can meet to work or individuals can practice presentations.

2. Carousel-type slide projector, 16 mm motion picture projector, cassette and/or reel-to-reel tape playback units (and sample films, slides and tapes).

Materials

Minimum Requirements

1. Copies of Participant Reference Manuals for each participant.

2. Copies of all handouts.
3. Writing paper and pencils/pens.
4. Materials for making transparencies (permanent felt-tipped markers and acetate sheets, Xerox and/or Thermofax transparency masters).

USING THIS STAFF GUIDE IN PLANNING AND CONDUCTING THE WORKSHOP

The Staff Guide is designed to provide you with all the basic information you need to plan and conduct the workshop. There are fourteen units of instruction, most of which are subdivided into individual lessons. Each unit is summarized in a Unit Overview and the lessons are described in detail in individual Instructional Package Worksheets (IPWs). Most of the lessons also have accompanying Support Materials for use in delivering the instruction. Support Materials may consist of Content Outlines (for conducting lectures or guided discussions), Figures (for overhead transparencies), and Handouts (for participant readings, notes, assignments, evaluation activities, etc.). Conduct of a given lesson may also depend heavily upon material in the Participant Reference Manual (in which case the use of such material is noted on the lesson Instructional Package Worksheet).

To plan the workshop, begin by reviewing all of the Unit Overviews and Instructional Package Worksheets to get an overall picture of the workshop's activities. Then go back through the material and study each unit and lesson in detail - including any accompanying materials in the Participant Reference Manual. Finally, complete the necessary preparations for delivering each lesson. Depending on the lesson, this may involve preparing transparencies or making copies of handouts. Make sure you also allow adequate time to prepare your own lectures - Content Outlines are not designed as scripts for lectures; but only as outlines of key instructional points and activities.

The function and contents of the Unit Overviews, Instructional Package Worksheets and various other materials contained in this manual are explained below.

Unit Overviews

Unit Overviews are designed to describe the activities of a whole unit of instruction. For most units, the overview summarizes the information and objectives contained in lesson Instructional Package Worksheets. The standard Unit Overview consists of the following parts:

Overview: A summary of the unit's instructional content and its relevance to the overall goal of the workshop.

Entering Competencies: The prerequisite skills and knowledge which participants should possess before beginning the unit in order to complete it successfully.

Summary of Objectives: A summary of the objectives of each of the unit's lessons. (As a summary, it is generally not stated in a strick behavioral format.)

Evaluation Activities: A description of those activities through which participant achievement of the unit's objective(s) is to be observed and/or judged.

References: Specific background readings relevant to the content of the unit. These references should be used by the instructor in preparing to deliver a unit containing any unfamiliar subjects.

Summary of Unit Activities: A brief outline of the unit including lesson titles, instructional methods/activities and their estimated duration, and a list of the specific support materials provided in the Staff Guide for conducting the instruction.

Lesson Instructional Package Worksheets

For almost every unit which is subdivided into individual lessons, each lesson is described in detail on individual Instructional Package Worksheets. (The only exception to this rule is Unit Thirteen for which the lesson Instructional Package Worksheets are to be created by the participants.) The standard Instructional Package Worksheet consists of the following components:

Entering Competencies: The prerequisite skills and knowledge which participants should possess before beginning the lesson.

Objective: The specific objective for that lesson stated in behavioral terms.

Justification: An explanation of the importance and role within the unit and the workshop as a whole.

Evaluation Activities: A description of those activities through which participant achievement of the lesson's objective is to be observed and/or judged.

Resources: A list of the specific support materials included for use in conducting the lesson's instructional activities.

Instructional Approach: A general set of directions for conducting the lesson. Typically these directions indicate the overall approach to be taken by the instructor along with an outline of key events.

To facilitate quick reference to various Unit Overviews and Lesson Instructional Package Worksheets, such pages have been edge-indexed by unit. The Index to Units on page 17 provides a guide to the use of this indexing system.

Support Materials

Support materials are the specific resources provided for conducting the instruction. There are three main types of support materials included in the Staff Guide: Content Outlines, Figures, and Handouts.

Content Outlines

Content Outlines expand upon the directions given under the "Instructional Approach" section of the Instructional Package Worksheets. They provide an outline of the content points to be included in lectures. When necessary, they also include detailed directions to the instructor on the conduct of the lesson. *(These directions are printed in italics.)*

Content Outlines are not intended to replace the instructor's lesson and lecture planning activities. Rather they are intended to provide a framework and brief illustration of the intended design of the lesson. They should also help the instructor to fit the actual workshop activities within the estimated time frames. (Instructors should take particular care to develop and practice their lectures to fit within the available time. If a lecture is too short or too long, the content outline should be reviewed and the level of detail contained in the lecture reconsidered.)

Figures

Figures have been designed for most of the lessons. They are illustrations designed to highlight, emphasize, or clarify the content of a lecture, discussion, or other activity. They are listed as "Resources" in the Lesson Instructional Package Worksheets (IPWs) and masters are located after the content outline for each lesson.

The Figures are designed to be used as overhead transparencies. (Use a Xerox or Thermofax machine and appropriate transparency film to create transparencies from the printed materials provided.) Specific use of the Figures is noted in the "Instructional Approach" section of the IPWs and in the Content Outlines. Figures are numbered sequentially by units. If you are not able to use the figures as transparencies, they must be copied and distributed as handouts.

Handouts

Handouts contain any materials intended to be distributed to participants during the instructional activities. They may include lecture notes for inclusion in the Participant Reference Manuals. They may also represent exercises, activities, or assignments of any kind to be completed by participants as part of a lesson. Handouts are also numbered sequentially within lessons and their intended use is noted in the "Instructional Approach" sections of Instructional Package Worksheets and in the Content Outlines. Masters are located after the content outline and figures for each lesson.

INDEX TO UNITS

UNIT ONE - INTRODUCTION

UNIT TWO - PROBLEM ANALYSIS

UNIT THREE - TASK ANALYSIS

UNIT FOUR - OBJECTIVES SPECIFICATION

UNIT FIVE - EVALUATION TECHNIQUES

UNIT SIX - INSTRUCTIONAL METHODS AND MEDIA

UNIT SEVEN - LESSON PLANNING

UNIT EIGHT - DEVELOPING ORAL COMMUNICATION SKILLS

UNIT NINE - DEVELOPMENT OF FIRST PRESENTATIONS

UNIT TEN - INSTRUCTIONAL MEDIA AND RELATED RESOURCES

UNIT ELEVEN - CLASSROOM MANAGEMENT

UNIT TWELVE - DEVELOPMENT OF SECOND PRESENTATIONS

UNIT THIRTEEN - WORKSHOP SUMMARY

UNIT FOURTEEN - EVALUATION AND CONCLUSION

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT ONE
INTRODUCTION - Unit Overview

Estimated time for unit - 2 hours 30 minutes

Overview

The explicit purpose of this unit is to introduce the workshop and explain its focus on a systematic approach to instruction. As a means of improving instructional effectiveness, the unit begins with participant introductions and brief recountings of personal experiences with good and bad instruction. The secondary purpose of this exercise is to get participants speaking before a group.

Entering Competencies

None.

Summary of Objectives

By the conclusion of this unit the participant will be able to:

-list and describe several qualities of good instruction

-state briefly the purpose of the workshop

-recreate the four-phase model of a systematic approach to instruction and explain it briefly.

Evaluation Activities

Summary Quiz on the points outlined in the objectives above.

References

Mager, R. F. and Beach, K. M., Jr. *Developing vocational instruction*. Belmont, CA: Fearon Publishers, 1967.

Popham, W. J. and Baker, E. L. *Systematic instruction*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1970.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) Introduction to the Qualities of Good Instruction	Lecture; Guided Discussion	75 min.	Handout 1.1 Figure 1.1
2) The Purpose of This Workshop	Lecture	30 min.	Figure 1.2 Content Outline
3) Systematic Approach to Instruction	Lecture	30 min.	Figure 1.3
Summary Quiz	Assignment	15 min.	Handout 1.2

UNIT ONE: INTRODUCTION
LESSON 1 of 3: INTRODUCTION TO THE QUALITIES OF GOOD INSTRUCTION

Estimated time: 75 minutes

Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the end of this lesson the workshop participants will be able to describe several qualities of good instruction from memory or from notes. Each participant will be able to give at least two examples and explain them to a group.
Justification	This lesson provides justification for the entire workshop as participants learn that "good instruction" is the product of a systematic process rather than a result of chance.
Evaluation Activities	The instructor will observe the ability of each participant to perform the above stated objective. A further check will occur on a Summary Quiz administered at the end of the complete unit. The instructor should also watch the presentations carefully to identify people who have trouble speaking to a group. These participants may require special assistance in subsequent workshop activities.
Resources	Figure 1.1 Unit One Outline Handout 1.1 Qualities of Instruction Note Sheet
Instructional Approach	1. Instructor's Introduction Welcome the participants, hand out name tags, etc., according to your personal teaching style. Introduce yourself and explain that the reason for this workshop is to enable each of them to learn some techniques for becoming good or better instructors. Using Figure 1.1, outline the lessons in this unit. Explain that to get the instruction rolling and to make sure that everyone has a common understanding of what is to be learned, the first activity will be a discussion of the qualities of good instruction.

2. Participants' Introductions and Presentations.

Hand out the note sheet and explain that each person will be asked to stand, give his/her name, occupation, and reason for taking the workshop and speak to the issue of good vs. bad instruction. Participants may outline and explain examples of each, may illustrate the subject with personal experiences, etc. Tell them that each of them must speak for five minutes. If the group seems uneasy or hesitant, volunteer to go first.

Your job throughout this lesson includes:

-making each speaker feel at ease
-encouraging reluctant or reticent speakers to continue until five minutes is over
-restricting talkative speakers to five minutes only
-keeping the presentations on task
-note taking, summarizing, etc., on a chalkboard or overhead projector.

UNIT ONE: INTRODUCTION

1. Introduction to the Qualities of Good Instruction

2. The Purpose of this Workshop

3. Systematic Approach to Instruction

Figure 1.1/Unit One Outline

UNIT ONE: INTRODUCTION
LESSON 1 of 3: INTRODUCTION TO THE QUALITIES OF GOOD INSTRUCTION

Handout 1.1: Qualities of Instruction Note Sheet

Qualities of Instruction Note Sheet

Assignment:

You will be asked to stand and speak to the group about the qualities of good instruction. You might talk about what you think is involved in good teaching, what results in bad teaching, etc. You may wish to give examples of both good and bad instruction from your own experience as a learner. Use this sheet to jot down any notes which might help you with your presentation.

"Good" Instruction (Qualities, examples, etc.)	"Bad" Instruction

UNIT ONE: INTRODUCTION
LESSON 2 of 3: THE PURPOSE OF THIS WORKSHOP

Estimated time: 30 minutes

Entering Competencies

None.

Objective

Behavior
Conditions
Acceptable Performance

By the end of this lesson participants will be able to explain, from memory, that the purpose of this workshop is to learn to plan instruction systematically using the Instructional Package Worksheet.

Justification

As trainers, participants will be required to plan instruction. They will need some format to summarize key elements involved in planning. The Instructional Package Worksheet (IPW) is one of the formats EPA uses for this purpose.

Evaluation Activities

Evaluation of the lesson will take place on the summary quiz for this unit.

Resources

Content Outline
Figure 1.2 Instructional Package Worksheet

Instructional Approach

Building on the participant presentations in Lesson 1, state that the most important way to develop effective and efficient instruction is through systematic planning.

Using Figure 1.2, introduce the IPW (copy in Participant Reference Manual) and explain that it is one format used by EPA to summarize key elements of a plan for instruction. Go through the forms line by line indicating the kinds of information requested. Explain that the reasons for including each piece of information will become apparent as we reach corresponding lessons in this workshop.

(If you are not familiar with the IPW format or have not used one yourself, you may wish to refer to the content outline which follows.)

UNIT ONE: INTRODUCTION
LESSON 2 of 3: THE PURPOSE OF THIS WORKSHOP

Content Outline

Estimated time for presentation: 30 minutes

INSTRUCTIONAL PACKAGE WORKSHEET CONTENT

CURRICULUM (TITLE):

COURSE (TITLE):

UNIT (NUMBER): (UNIT TITLE)

LESSON (NUMBER) of (TOTAL NUMBER of LESSONS in UNIT): (LESSON TITLE)

Estimated time: (NUMBER of MINUTES to COMPLETE LESSON)

Entering Competencies	(Previous skills/knowledge needed to begin this lesson)
Objective	(What the participants as trainees
Behavior	will be able to do,
Conditions	under what conditions,
Acceptable Performance	with what degree of performance)
Justification	(Statement explaining the importance of the lesson and the value of the skill/knowledge to be gained)
Evaluation Activities	(The method or methods by which learners' successful completion of the lesson objectives is measured)
Resources	(Support materials used by the instructor during the lesson)
Instructional Approach	(Description of the sequence of activities through which the trainees will gain mastery of the objectives, stated in terms of what the instructor will do)

INSTRUCTIONAL PACKAGE WORKSHEET

CURRICULUM:

COURSE:

UNIT:

LESSON:

Estimated time:

Entering Competencies

Objective

Behavior

Conditions

Acceptable Performance

Justification

Evaluation Activities

Resources

Instructional Approach

Figure 1.2/Instructional Package Worksheet

UNIT ONE: INTRODUCTION
LESSON 3 of 3: SYSTEMATIC APPROACH TO INSTRUCTION

Estimated time: 45 minutes

Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the end of this lesson the participants will be able to list the four phases of a systematic approach to instruction and explain each briefly by recall. All four phases will be listed and the explanations will be correct as judged by the instructor.
Justification	This lesson provides a framework upon which the instruction of this workshop is built. It reinforces the concept that good instruction is the result of systematic planning.
Evaluation Activities	Summary Quiz to be given at the end of this lesson.
Resources	Figure 1.3 The Instructional Development Process Handout 1.2 Summary Quiz
Instructional Approach	Using Figure 1.3, present and explain the four-phase model. (Participants have a summary of the model in their reference manuals. A copy is attached.) Explain that the next six units of the workshop teach specific procedures for performing each of the functions given in the model. Further underscore the relevance of this instruction by pointing out that each of these procedures will yield specific information for use in filling out the Instructional Package Worksheets. Finally, briefly describe the remaining units of the workshop. Administer the Summary Quiz (Handout 1.2).

(From Participant Reference Manual)

UNIT ONE: INTRODUCTION
CONTENT SUMMARY

This workshop will show how to plan effective training according to the following model.

Phase One: ANALYSIS

1.	Define the problem	(Unit Two)
2.	Analyze the tasks	(Unit Three)

Phase Two: DESIGN

3.	Specify instructional objectives	(Unit Four)
4.	Determine evaluation activities	(Unit Five)

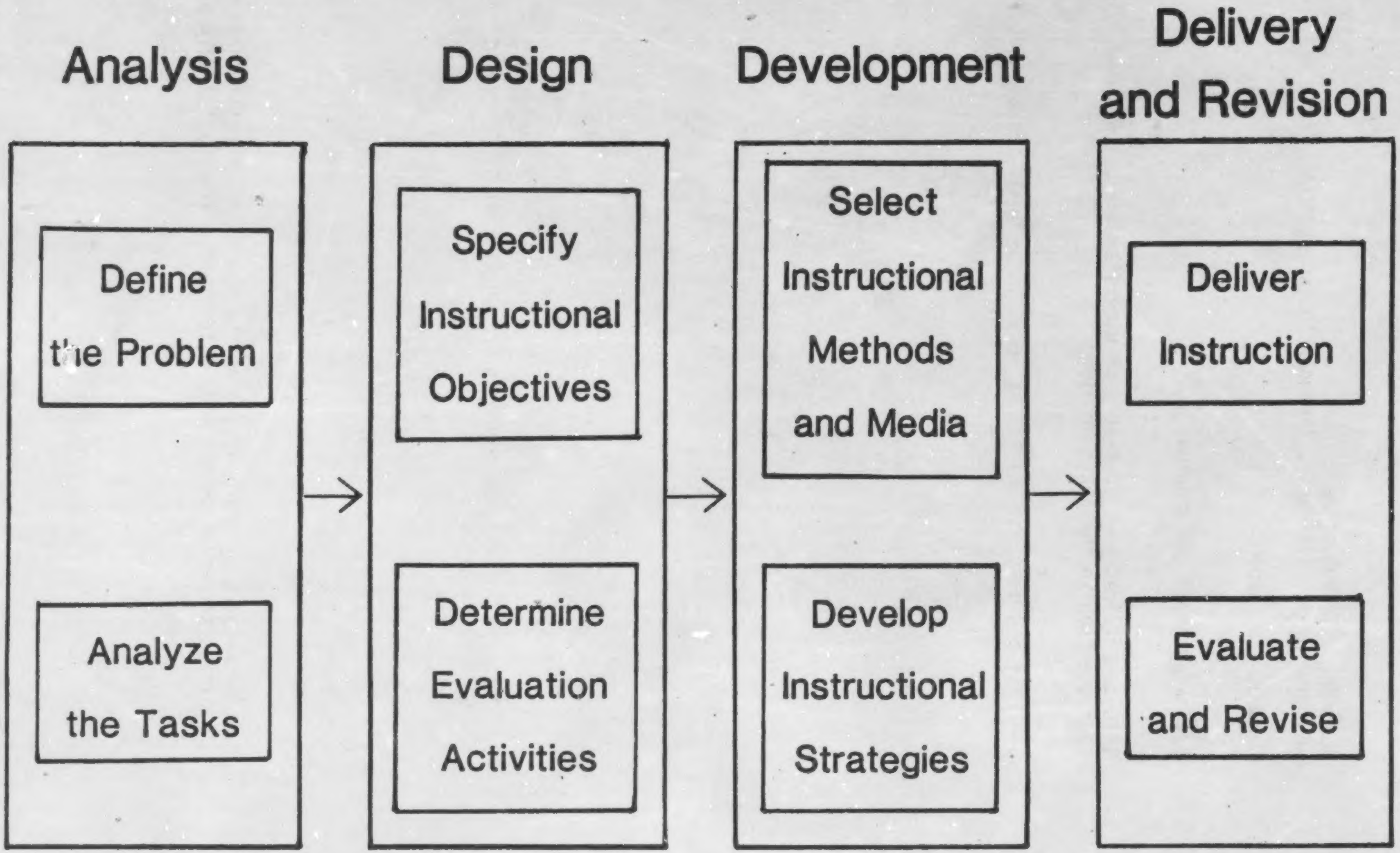
Phase Three: DEVELOPMENT

5.	Select instructional methods and media	(Unit Six)
6.	Develop instructional strategies	(Unit Seven)

Phase Four: DELIVERY and REVISION

7. Deliver instruction (practice provided in Units Ten and Thirteen)
8. Evaluate and revise (considered in Unit Fourteen)

THE INSTRUCTIONAL DEVELOPMENT PROCESS



Analysis

- Define the Problem
- Analyze the Tasks

Design

- Specify Instructional Objectives
- Determine Evaluation Activities

Development

- Select Instructional Methods and Media
- Develop Instructional Strategies

Delivery and Revision

- Deliver Instruction
- Evaluate and Revise

Figure 1.3/The Instructional Development Process

UNIT ONE: INTRODUCTION
LESSON 3 of 3: SYSTEMATIC APPROACH TO INSTRUCTION

Handout 1.2: Summary Quiz

Estimated time: 15 minutes

This quiz is designed to test your understanding of Unit One. Answer each question in the space provided.

1. List and describe briefly at least three qualities of good instruction.

   a.

   b.

   c.

2. From the information given in Lesson 2, what is the stated purpose of this workshop?

3. On the back of this page, list the phases and functions of the model of a systematic approach to instruction. Briefly describe each phase.

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT TWO
PROBLEM ANALYSIS - Unit Overview

Estimated time for unit - 2 hours

Overview

Effective training must be designed to address a specific, well-defined problem. This unit introduces workshop participants to a systematic approach to the analysis of personnel performance problems. Unit activities feature a simulation exercise in which participants complete a problem analysis in a situation similar to their work settings. A checklist type worksheet is used to guide the problem analysis process.

Entering Competencies

None.

Summary of Objectives

By the end of this unit the participants will be able to:

-define a problem as the difference between the actual and the ideal situation

-describe the problem categories: skill or knowledge, motivation or incentive, and environmental.

Evaluation Activities

The extent to which the participants master the objectives of this unit will be evaluated during their participation in lesson discussions and through their work on the Problems Definition Worksheet in Lesson Three.

References

Harless, J.H. An ounce of analysis (is worth a pound of objectives). McLean, VA: Harless Performance Guild, Inc., 1975.

Mager, R.F. and Pipe, P. Analyzing performance problems (or 'you really oughta wanna'). Belmont, CA: Fearon Publishers, 1970.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) Introduction	Lecture; Guided Discussion	30 min.	Figure 2.1-2.5 Content Outline
2) Categories of Problems	Lecture; Guided Discussion	30 min.	Figure 2.6-2.9 Content Outline
3) Using the Problem Definition Worksheet	Lecture; Assignment	60 min.	Figure 2.10-2.12 Handout 2.1, 2.2

UNIT TWO: PROBLEM ANALYSIS
LESSON 1 of 3: INTRODUCTION TO PROBLEM ANALYSIS

Estimated time: 30 minutes

Entering Competencies	While no specific competencies are necessary to begin this lesson, the ability to explain the steps of the systematic design process is helpful.
Objective *Behavior* *Conditions* *Acceptable Performance*	Participants will be able to distinguish between correctly and incorrectly defined problems. Given sample problem statements, they will be able to explain why each statement is adequate (by identifying those which state what the problem is) or inadequate (by identifying those which describe either the cause of a problem or its proposed solution).
Justification	The most important first step in attempting to solve a personnel performance problem is determining what the problem actually is. Instead of describing problems in this way, many people immediately begin to suggest solutions. This lesson shows the participants how to recognize the differences between problems, symptoms of problems and solutions.
Evaluation Activities	Participants' understanding of the content of this lesson will be evaluated through their critique of sample problem statements in class.
Resources	Content Outline Figure 2.1 Define the Problem 2.2 Unit Two Outline 2.3 Problem #1 2.4 Problem Definition 2.5 Problem #2
Instructional Approach	This lesson involves both lecture and guided discussion activities. Two major points are to be made: 1) most problems are incorrectly stated in terms of their causes or proposed solutions, 2) problems should be defined as discrepancies or deficiencies. An outline of the activities of this lesson includes:

1. Using Figure 2.1, explain that this unit is concerned with the first step of the systematic approach to instruction, "Define the Problem".

2. Show Figure 2.2 to introduce the unit's lessons.

3. Begin discussion of the problem statements using Figure 2.3 and the Content Outline.

4. Introduce the concept of a problem defined as the discrepancy between the ideal situation and what is perceived to be the problem situation (Figure 2.4).

5. Repeat the discussion with Problem #2 in Figure 2.5.

6. Continue the discussion with problem statements suggested by the workshop participants.

UNIT TWO: PROBLEM ANALYSIS
LESSON 1 of 3: INTRODUCTION TO PROBLEM ANALYSIS

Content Outline

Estimated time: 30 minutes

I. Incorrectly Stated Problem #1 (lecture, guided discussion, 10 minutes)

Figure 2.3 *Introduce this lesson by stating that the first task to be accomplished is to analyze problem statements. Show Figure 2.3 which states a problem:*

> Our office needs an in-service program to retrain Wastewater Treatment Plant Operators.

Start a discussion by asking what the participants think of the problem. After two to four comments, stop the discussion and tell them the statement is not a problem. Explain that it is a proposed solution to some problem. From this statement we know only that someone thinks these operators need training. We do not know what problem or problems exist that lead them to think so. Plant operation procedures may have been changed, new equipment may have been installed, or perhaps some existing duties are not being performed to satisfaction. This "problem statement" does not give a clue as to where the real problem lies.

Figure 2.4 *Explain that a problem might be better thought of as a discrepancy or deficiency between the way things are and the way things ought to be. Give some examples such as:*

- *Assembly line workers are taking fifteen minutes to complete a task when they should be able to do it in ten.*
- *Donut makers are producing six dozen donuts per minute when they should be producing eight.*
- *Inspectors are reporting "x" and "y" situations as needing improvement when only "y" situations actually do.*

Make the point that these examples are simple and crude to clearly illustrate the point. Solicit examples from participants to illustrate discrepancy situations in work settings.

II. Incorrectly Stated Problem #2 (lecture, guided discussion, 5 minutes)

Figure 2.5 *Show Figure 2.5 and repeat the procedure followed for the first problem. This second problem is:*

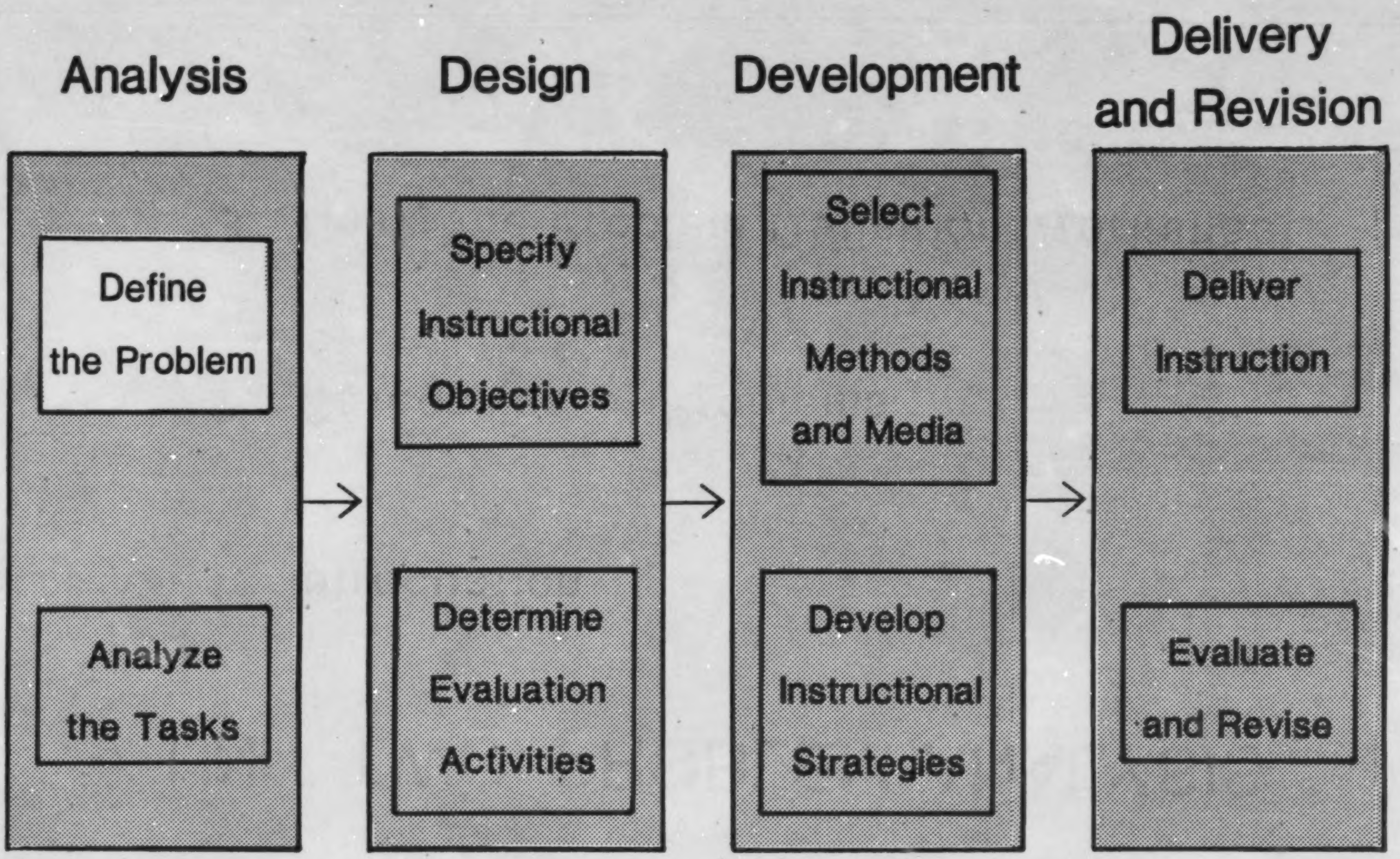
> Our employees do not care very much about the quality of their work.

In this case, point out that the fault with this statement is that it describes either a cause or a symptom of a problem. Guide the discussion so that the participants understand that the problem might be low quality work. Or perhaps low quality work is a symptom of a larger problem. The major point to leave with them is that a problem must be considered very carefully before solutions are determined.

III. Participants' Problem Statements (guided discussion, 15 minutes)

To insure participant understanding of the nature of well-defined problems, have different people suggest personnel performance problems from their own experience. (You may want to write them on the board.) Then ask other participants to consider whether the problems have been properly stated.

THE INSTRUCTIONAL DEVELOPMENT PROCESS



Analysis
- Define the Problem
- Analyze the Tasks

Design
- Specify Instructional Objectives
- Determine Evaluation Activities

Development
- Select Instructional Methods and Media
- Develop Instructional Strategies

Delivery and Revision
- Deliver Instruction
- Evaluate and Revise

Figure 2.1/Define the Problem

UNIT TWO: PROBLEM ANALYSIS

1. Introduction
2. Categories of Problems
3. Using the Problem Definition Worksheet

Figure 2.2/Unit Two Outline

PROBLEM #1

Our office needs an in-service program to retrain Wastewater Treatment Plant Operators.

Figure 2.3/Problem #1

PROBLEM

A discrepancy or deficiency between the way things are and the way things ought to be

Figure 2.4/Problem Definition

PROBLEM #2

Our employees do not care very much about the quality of their work.

Figure 2.5/Problem #2

UNIT TWO: PROBLEM ANALYSIS
LESSON 2 of 3: CATEGORIES OF PROBLEMS

Estimated time: 30 minutes

Entering Competencies

Participants should be able to distinguish between correctly and incorrectly defined problems.

Objective

By the conclusion of this lesson participants
Behavior will be able to identify a problem as repre-
Conditions senting one of three categories of problems.
Given a sample problem the participants will,
Acceptable Performance without error, assign a problem to the 1) skill
or knowledge, 2) motivation or incentive, or
3) environmental problem categories.

Justification

Knowing the type of problem is essential to correctly determining what solution is most appropriate or effective. This lesson introduces the participants to the three types or categories into which personnel performance problems may be classified. It also stresses that training is often not suitable for motivational or environmental problems.

Evaluation Activities

Participants will check their own work on a problem classification exercise which they will complete as part of Lesson Three.

Resources

Content Outline
Figure 2.6 Categories of Problems
2.7 Skill or Knowledge Problems
2.8 Motivation or Incentive Problems
2.9 Environmental Problems

Instructional Approach

This lesson consists of a lecture which defines and explains the three categories into which problems may be classified.

1. Begin the lecture by pointing out that not all problems are alike (i.e., that different types of problems require different types of solutions). Present the categories using Figure 2.6, Categories of Problems.

2. Show Figure 2.7, Skill or Knowledge Problems. Describe the kinds of problems which fall into this category and point out some indicators. Repeat this with the other categories using Figure 2.8, Motivation or Incentive Problems and Figure 2.9, Environmental Problems.

3. Discuss the categories and entertain questions to clear up any confusion before moving on to the next lesson.

UNIT TWO: PROBLEM ANALYSIS
LESSON 2 of 3: CATEGORIES OF PROBLEMS

Content Outline

Estimated time: 30 minutes

I. Categories (lecture, 5 minutes)

Figure 2.6 *Begin by telling the participants that not all personnel performance problems require training. There are many different kinds of problems. However, they can be classified into three general categories.*

1. *LACK OF* SKILLS OR KNOWLEDGE
2. *LACK OF* MOTIVATION OR INCENTIVE
3. ENVIRONMENTAL *CONSTRAINTS*

II. Skill or Knowledge Problems (lecture, 5 minutes)

Figure 2.7 *Using Figure 2.7 describe these problems as ones in which people do not know what to do or how to do it. They may want to perform a task but they simply do not have the training for it. These are the problems for which training solutions are indicated.*

III. Motivation or Incentive Problems (lecture, 5 minutes)

Figure 2.8 *Define motivation problems as cases where, for some reason or reasons, people do not want to perform the task. They may know how to do it. In these cases, putting them through a training program will not solve the problem.*

IV. Environmental Problems (lecture, 5 minutes)

Figure 2.9 *Explain that environmental problems are typically cases in which the organization is hindering effective performance. These problems are not training problems either. Many times they are management problems.*

V. Discussion (guided discussion, 10 minutes)

Lead a discussion of categories of problems, asking for examples from participants' work situations. Concentrate on showing how motivation problems and environmental problems are not usually soluble through training.

CATEGORIES OF PROBLEMS

1. Lack of SKILL OR KNOWLEDGE
2. Lack of MOTIVATION OR INCENTIVE
3. ENVIRONMENTAL Constraints

Figure 2.6/Categories of Problems

SKILL OR KNOWLEDGE PROBLEMS

Include all cases where people do not know what to do or how to do it.

Figure 2.7/Skill or Knowledge Problems

MOTIVATION OR INCENTIVE PROBLEMS

Include situations where people may know how to do something but do not want to do it

Figure 2.8/Motivation or Incentive Problems

ENVIRONMENTAL PROBLEMS

Involve situations where people know how to do something and want to do it but something about the work situation or organization will not let them perform effectively

Figure 2.9/Environmental Problems

UNIT TWO: PROBLEM ANALYSIS
LESSON 3 of 3: USING THE PROBLEM DEFINITION WORKSHEET

Estimated time: 60 minutes

Entering Competencies

Participants must be able to distinguish among 1) skill or knowledge, 2) motivation or incentive, and 3) environmental problems.

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson the participants will be able to define a personnel performance problem in detail, given the "Problem Definition Worksheet" and either a sample problem or one of their own choice. Each item of the worksheet will be completed and the problem will be defined accurately as determined by the instructor.

Justification

The systematic completion of a worksheet can be useful in guiding managers and trainers through the problem definition process. This lesson introduces this worksheet and provides for practice in using it. The worksheet allows trainers to compile information and make decisions necessary for continuing the systematic development of instruction.

Evaluation Activities

Participants will compare their own work to the results given by the instructors.

Resources

Figure	2.10	Completed Worksheet (page 1)
	2.11	Completed Worksheet (page 2)
	2.12	Completed Worksheet (page 3)
Handout	2.1	Problem Definition Worksheet
	2.2	Problem Scenario

Instructional Approach

The primary activity of this lesson is an exercise in which the participants analyze a problem situation using the Problem Definition Worksheet. After explaining the use of the worksheet, offer assistance to those participants who request it as they work alone on their assignments. Describe an example of a completed worksheet.

1. Hand out copies of the worksheets and briefly (ten minutes) explain the items and what is to be done.

2. Hand out copies of a problem scenario and have the participants spend thirty minutes analyzing the problem and filling out the worksheet. Circulate and give individual help as necessary.

3. Show Figure 2.10 to 2.12, Completed Worksheet, and go through the sample responses to each item. Note: It is quite likely that some participants will have ended up with very different results. It is important to assure them that they are not failing a test. Remind them that this is their first exposure to this material and that the sample completed worksheet is only one interpretation of the problem.

4. In the discussion of the completed response to the problem scenario, point out that the most desirable solution in this case appears to be some form of training. Talk about and ask for participants' examples of problems which tend to fall into columns "B" and "C". Discuss how training might be ineffective for employees who:

   -are late for work
   -do not wear or use safety equipment
   -do not produce the desired amount of
    work because they are continually
    waiting for supplies or equipment.

PROBLEM DEFINITION WORKSHEET

(1) Something has caused you to suspect a personnel performance problem. What is it? Describe the problem briefly in the space below.

Suspended solids data for effluents is not consistent with other effluent data. Records of operating conditions do not explain the inconsistency.

(2) Identify the specific employees by job or position title (not name) that are involved in or affected by the problem described above.

Operators and laboratory technicians with duties of a chemist in wastewater treatment plants.

(3) What are the characteristics of this problem? Check as many of the following items as seem relevant.

A

- ✓ new people have been hired
- ___ experienced people have new tasks or responsibilities
- ___ new equipment, facilities or technology is being used
- ___ new information exists
- ___ output of work is low
- ✓ people cannot perform a task effectively
- ✓ people do not know how to perform a task

B

- ___ undesirable attitudes toward work are present
- ___ people do not seem to want to work
- ___ there are no rewards for doing well
- ___ employees provide poor service
- ___ people feel that getting job done is not worth the effort
- ✓ employees rarely receive feedback on their performance
- ___ employees are punished for poor performance

C

- ___ everything takes too long
- ___ there is not enough time to do the work
- ___ equipment frequently does not work or breaks down often
- ___ supplies sometimes run out
- ___ new management or management policy exists
- ✓ employees rarely talk to their superiors
- ___ weak or inefficient management is apparent
- ___ people frequently seem to have nothing to do

Figure 2.10/Completed Worksheet (p. 1)

(4) In which of the columns (Step 3) are most of the items you checked located?

✓ A? ____B? ____C?

If A, you appear to have a problem where employees lack skill or knowledge.

If B, the immediate indications are that there is a motivation or incentive problem.

If C, it is likely that you are faced with an environmental problem. (Something in the work setting is preventing people from performing effectively.)

(5) At this point, it is helpful to summarize the information gained in the previous steps. You should now be able to describe your problem in terms of WHO is affected (Step 2), WHAT is involved (Step 3), and WHY (Step 4). (You may also want to gather some further information about the specific nature of the problem at this point in order to develop more specific answers to the WHO, WHAT, and WHY questions.)

Write a clear summary of the problem in the following format:

WHO persons with chemist duties in wastewater trt. plants
WHAT are new on the job and unable to correctly
determine the solids content of treated water
WHY because they lack necessary skills or knowledge.

(If a variety of different jobs are affected by or involved in this problem, it may be useful to construct separate problem statements for each.)

(6) Is a training program a relevant solution to the specific problem defined above? Consider the following points as appropriate to the identified cause of the problem (Step 4).

-If you identified your problem as involving an employee lack of skill or knowledge, you may want to consider a training program.

-If you decided that you have a motivation or incentive problem, you may want to discuss the situation with others to insure that this problem lends itself to a training solution. (Many times a change in organizational policy or management procedures is a more effective solution.)

-If the problem seems to involve something in the work environment, it is rather unlikely that a training program is a relevant

Figure 2.11/Completed Worksheet (p. 2)

solution. (Investigate the situation further and consider direct changes in the work setting.)

Does a training program represent a relevant solution to your problem?

_✓_ Yes   ____ No

What other kinds of actions might be taken to address the problem in combination with or instead of a training program?

Additional strategies: In some cases, individual supervisors may be able to assist,

(7) If you are still certain that some form of training program is called for, proceed to analyze the training need for such a program using the Job Task Summary Sheet. Separate Job Task Summary Sheets must be completed for each job to be the subject of training.

Figure 2.12/Completed Worksheet (p. 3)

UNIT TWO: PROBLEM ANALYSIS
LESSON 3 of 3: USING THE PROBLEM DEFINITION WORKSHEET

Handout 2.1: Problem Definition Worksheet

PROBLEM DEFINITION WORKSHEET

(1) Something has caused you to suspect a personnel performance problem. What is it? Describe the problem briefly in the space below.

(2) Identify the specific employees by job or position title (not name) that are involved in or affected by the problem described above.

(3) What are the characteristics of this problem? Check as many of the following items as seem relevant.

A

___new people have been hired

___experienced people have new tasks or responsibilities

___new equipment, facilities or technology is being used

___new information exists

___output of work is low

___people cannot perform a task effectively

___people do not know how to perform a task

B

___undesirable attitudes toward work are present

___people do not seem to want to work

___there are no rewards for doing well

___employees provide poor service

___people feel that getting job done is not worth the effort

___employees rarely receive feedback on their performance

___employees are punished for poor performance

C

___everything takes too long

___there is not enough time to do the work

___equipment frequently does not work or breaks down often

___supplies sometimes run out

___new management or management policy exists

___employees rarely talk to their superiors

___weak or inefficient management is apparent

___people frequently seem to have nothing to do

(4) In which of the columns (Step 3) are most of the items you checked located?

____A? ____B? ____C?

If A, you appear to have a problem where employees lack skill or knowledge.

If B, the immediate indications are that there is a motivation or incentive problem.

If C, it is likely that you are faced with an environmental problem. (Something in the work setting is preventing people from performing effectively.)

(5) At this point, it is helpful to summarize the information gained in the previous steps. You should now be able to describe your problem in terms of WHO is affected (Step 2), WHAT is involved (Step 3), and WHY (Step 4). (You may also want to gather some further information about the specific nature of the problem at this point in order to develop more specific answers to the WHO, WHAT, and WHY questions.)

Write a clear summary of the problem in the following format:

WHO

WHAT

WHY

(If a variety of different jobs are affected by or involved in this problem, it may be useful to construct separate problem statements for each.)

(6) Is a training program a relevant solution to the specific problem defined above? Consider the following points as appropriate to the identified cause of the problem (Step 4).

- If you identified your problem as involving an employee lack of skill or knowledge, you may want to consider a training program.
- If you decided that you have a motivation or incentive problem, you may want to discuss the situation with others to insure that this problem lends itself to a training solution. (Many times a change in organizational policy or management procedures is a more effective solution.)
- If the problem seems to involve something in the work environment, it is rather unlikely that a training program is a relevant

solution. (Investigate the situation further and consider direct changes in the work setting.)

Does a training program represent a relevant solution to your problem?

____ Yes ____ No

What other kinds of actions might be taken to address the problem in combination with or instead of a training program?

Additional strategies:

(7) If you are still certain that some form of training program is called for, proceed to analyze the training need for such a program using the Job Task Summary Sheet. Separate Job Task Summary Sheets must be completed for each job to be the subject of training.

UNIT TWO: PROBLEM ANALYSIS
LESSON 3 of 3: USING THE PROBLEM DEFINITION WORKSHEET

Handout 2.2: Problem Scenario

Problem Scenario

You are a trainer in a regional office of a "Water Management Bureau". Your supervisor has called you into a meeting to give you the following information:

> Spot inspections of the data for effluents in a number of wastewater treatment plants revealed that the suspended solids data was not consistent with other effluent data during the past six months. Preliminary investigation showed that:
>
> -suspended solids data was consistent with other effluent data for the same seasonal periods at earlier dates
>
> -the recent plant operating conditions were comparable to those in the earlier, same seasonal periods when the effluent data was consistent

Your supervisor has given the project to you. You are directed to investigate further to determine what the problem is and if training is required to solve it.

You visit the plants in question and learn that new personnel (hired within the last six months) conduct the suspended solids tests. A few of the newly-hired work for experienced supervisors but only meet with the supervisor for very limited periods of time because of twenty-four hour operations and shift rotations. At the other plants, no one except the new employee is experienced in conducting the suspended solids test.

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT THREE
TASK ANALYSIS - Unit Overview

Estimated time for unit - 2 hours 15 minutes

Overview	To design training relevant to a job-related problem, it is first necessary to identify all the component tasks of that job. This unit introduces the process of analyzing a job to define its tasks at various levels of detail. Workshop participants will learn to match the tasks to the appropriate type of learning required for their performance. Finally, participants will learn to use the Job Task Summary Sheet to guide their analyses and practice applying it to the simulated problem introduced in Unit Two.
Entering Competencies	None are necessary. However, the exercises in this unit build upon previous work completed in the workshop.
Summary of Objectives	Given a written job description and task summary sheets, the participants will be able to list and detail the tasks required to perform the job.
Evaluation Activities	The participants will be given a job description to be broken down into tasks with detailed information about each.
References	Mager, R.F., and Beach, Jr., K.M. Developing vocational instruction. Belmont, CA: Fearon Publishers, 1967.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) Introduction to Job Analysis	Guided Discussion	45 min.	Figure 3.1 - 3.6 Handout 3.1 Content Outline
2) Using the Job Task Summary Sheet and the Task Detailing Sheet	Demonstration, Assignment	60 min. 30 min.	Figure 3.7 - 3.12 Handout 3.2 - 3.6 Content Outline

UNIT THREE: TASK ANALYSIS
LESSON 1 of 2: INTRODUCTION TO JOB ANALYSIS

Estimated time: 45 minutes

Entering Competencies

None.

Objective

By the conclusion of this lesson the participants
Behavior will be able to define the concepts: job, job
Conditions description, task, and task analysis from memory.
Acceptable Performance The descriptions will paraphrase the definitions given in the lesson.

Justification

The participants must understand the relationship between a job and the tasks of which it is composed as the basis for planning training in that job.

Evaluation Activities

Each participant will complete a brief definition exercise which will be reviewed in class by another participant.

Resources

Content Outline
Figure 3.1 Analyze the Tasks
3.2 Unit Three Outline
3.3 Job - Definition
3.4 Job Description - Definition
3.5 Task - Definition
3.6 Task Analysis - Definition
Handout 3.1 Definition Review

Instructional Approach

This lesson introduces the concept that a job is composed of tasks or behaviors. It is through the specification of these tasks that effective training is developed. Your plan should be to present these concepts using an interactive (guided discussion) approach.

1. Introduce the unit and identify its location within the Instructional Design Model.

2. Define the terms: job description, task and task analysis using the content outline and accompanying figures. Elicit suggestions and examples from the participants both to involve them in contributing

to the learning process and to ensure that the terms are understood.

3. Discuss the need for a task analysis as a prerequisite to the development of instruction.

4. Have participants complete Definitions Review, exchange papers, and discuss answers.

UNIT THREE: TASK ANALYSIS
LESSON 1 of 2: INTRODUCTION TO JOB ANALYSIS

Content Outline

Estimated time for presentation: 45 minutes

I. Introduction (lecture, 5 minutes)

Figure 3.1 — *Use Figure 3.1 to explain that we have finished Step One and are now at the second step, Analyze the Tasks, of the Instructional Design Model.*

Figure 3.2 — *Use Figure 3.2 to introduce the lessons of the unit.*

II. Definition of Terms (lecture, 25 minutes)

A. Define "job" and "job description".

Figure 3.3 — 1. A job is the occupational title or position held by an employee.

Figure 3.4 — 2. A job description is a statement (or statements) outlining areas of responsibility (duties) of a given position.

Lead a guided discussion in which you first call upon the participants to explain what a job is. After the participants suggest a few definitions, present your own (Figure 3.3) and also give your definition of a job description (Figure 3.4). Have the participants give an example of each to make sure that the terms are understood. Then point our that we really know very little about what an employee actually does from a job description alone.

B. Define "task" and "task analysis".

Figure 3.5 — 1. A task is one of the skills or operations which belong to a specific area of responsibility. Each task usually consists of specific and distinct steps for its completion.

Figure 3.6 — 2. Task Analysis is the act of dividing a duty into all of its components. It results in a list of everything an employee must do to advance the work to completion.

Continue the discussion by presenting the definitions of tasks and task analysis given above. Using one of the jobs and job descriptions suggested by the participants during the first part of this lesson, ask for examples of some of the tasks that make up one area of responsibility of that job.

C. Discuss the need for a task analysis in developing job training. Make sure the following points are raised in the discussion.

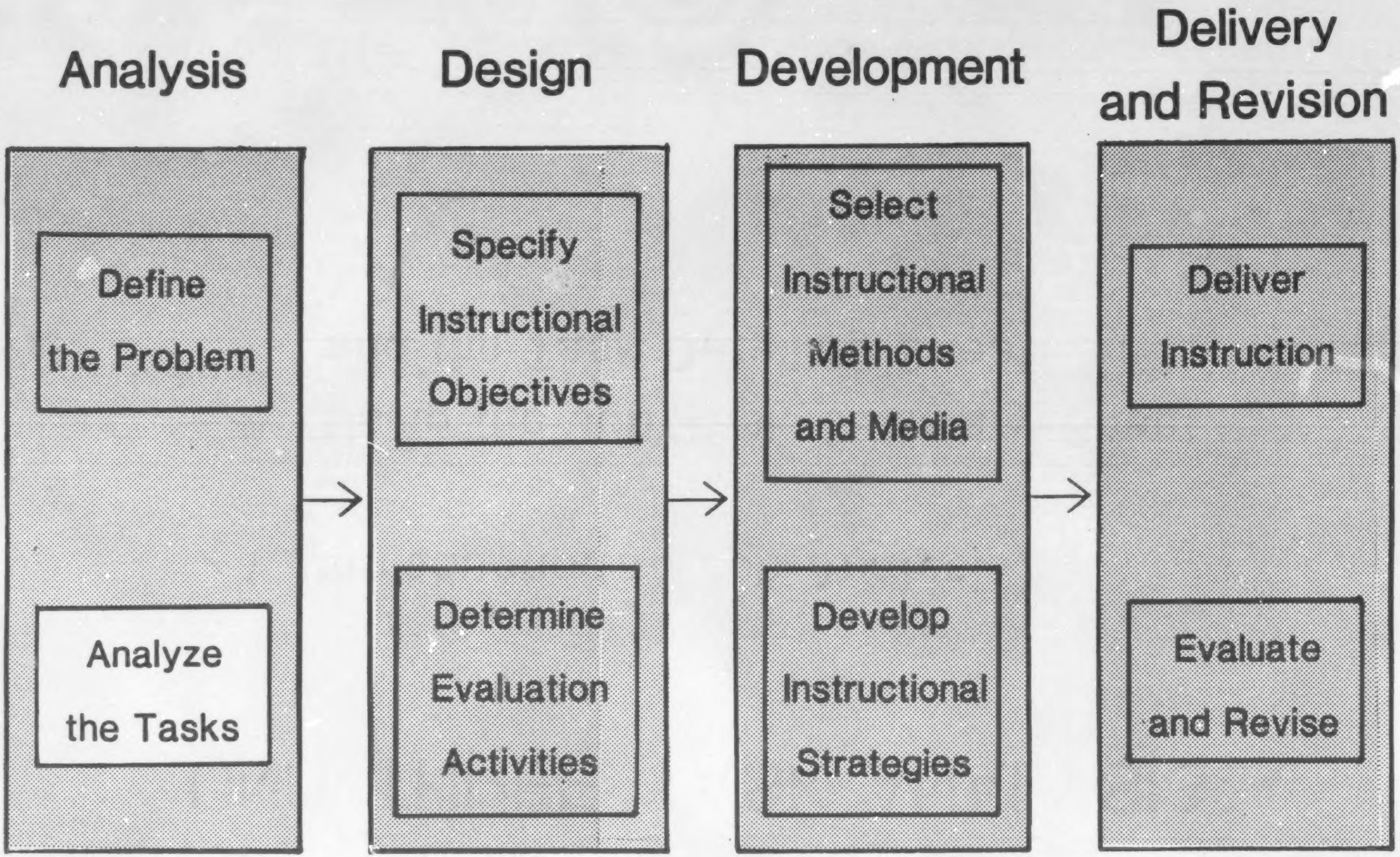
1. *A job description is not specific enough to be used as the basis on which to teach that job.*

2. *It is essential to have a thoroughly defined and logically related set of actions to ensure that no details are forgotten and that instruction for teaching the job is uniform.*

III. Definition Review (assignment and guided discussion, 15 minutes)

Distribute the Definition Review sheet and allow participants five minutes to complete it. Have participants exchange papers. Lead a summary discussion of these concepts by calling on participants to read and comment on the definitions. As you see the group understands each concept, move on to the next. Limit the total time for this exercise to fifteen minutes.

THE INSTRUCTIONAL DEVELOPMENT PROCESS



Analysis

Define the Problem

Analyze the Tasks

→

Design

Specify Instructional Objectives

Determine Evaluation Activities

→

Development

Select Instructional Methods and Media

Develop Instructional Strategies

→

Delivery and Revision

Deliver Instruction

Evaluate and Revise

Figure 3.1/Analyze the Tasks

UNIT THREE: TASK ANALYSIS

1. Introduction to Job Analysis
2. Using the Job Task Summary Sheet and the Task Detailing Sheet

Figure 3.2/Unit Three Outline

JOB

The occupational title or position held by an employee

Figure 3.3/Job - Definition

JOB DESCRIPTION

A statement (or statements)
outlining the areas of
responsibility (duties) of a given position

Figure 3.4/Job Description - Definition

TASK

Each of the skills or operations which belong to a specific area of responsibility.

Each task usually consists of specific and distinct steps for its completion.

Figure 3.5/Task - Definition

TASK ANALYSIS

The act of dividing a duty into all its components.

It results in a list

of everything an employee must do

to advance the work to completion.

Figure 3.6/Task Analysis - Definition

UNIT THREE: TASK ANALYSIS
LESSON 1 of 2: INTRODUCTION TO JOB ANALYSIS

Handout 3.1: Definition Review

In order to make sure that everyone taking this workshop has a clear understanding of the concepts covered in this lesson, please write a definition in your own words for each of the terms given below.

Job

Job Description

Task

Task Analysis

UNIT THREE: TASK ANALYSIS
LESSON 2 of 2: USING THE JOB TASK SUMMARY SHEET AND THE TASK DETAILING SHEET

Estimated time: 90 minutes

Entering Competencies

Participants must be able to define Job, Job Description, Task, and Task Analysis.

Objective

Behavior	By the conclusion of this lesson the participants will be able to complete a task analysis.
Conditions	Given a job description, the Job Task Summary Sheet and the Task Detailing Sheet,
Acceptable Performance	the participants must list all of the tasks required of a job and all of the steps required to perform at least one task.

Justification

A thorough task analysis, including the listing, categorizing and detailing of those tasks, is necessary for precise development of instructional objectives.

Evaluation Activities

The instructor will circulate among the participants during the assignment segment of the lesson to ensure that the information on tasks and procedures is properly entered on the Job Task Summary Sheet.

Resources

Content Outline

Figure	3.7	Job Task Summary Sheet
	3.8	Types of Behavior
	3.9	Levels of Cognitive Behavior
	3.10	Task Detailing Sheet
	3.11	Completed Job Task Summary Sheet
	3.12	Completed Task Detailing Sheet
Handout	3.2	Job Task Summary Sheet
	3.3	Task Detailing Sheet
	3.4	Sample Job Description
	3.5	Completed Job Task Summary Sheet
	3.6	Completed Task Detailing Sheet

Instructional Approach

In this lesson the workshop participants are shown how to complete a step-by-step procedure for dividing a job list into its component tasks. They also learn how to further specify the tasks by detailing the steps required to complete them. The Job Task Summary Sheet and the Task Detailing

Sheet are introduced and used to guide the process of task analysis. Types and levels of behavior are explained. Participants will practice completing a task analysis using these materials.

1. Use Figure 3.7 to 3.10 to explain each step of the task specification procedure (twenty minutes).

2. Distribute Handout 3.2 to 3.4 and have participants continue with the problem they began in Unit Two. Allow approximately thirty minutes to complete this activity. The participants should work alone. After they have begun, circulate among them to make sure each person is on the right track.

3. Distribute Handout 3.5 and 3.6 and use Figure 3.11 and 3.12 of the completed forms to explain how the problem may have been approached. Lead the group in a discussion of the information the participants recorded on the form.

UNIT THREE: TASK ANALYSIS
LESSON 2 of 2: USING THE JOB TASK SUMMARY SHEET AND THE TASK DETAILING SHEET

Content Outline

Estimated time for presentation: 90 minutes

I. Demonstration of the Use of the Job Task Summary Sheet (demonstration, 25 minutes)

Figure 3.7

Explain that you are going to go through each of the items on the JTSS. If possible use a transparency of Figure 3.7 and a non-permanent overhead projector pen. The workshop participants will have copies of the JTSS forms in their reference manuals and should be encouraged to take notes on them as you go through each step.

JOB TASK SUMMARY SHEET

A. Job Title *e.g., Program Analyst, Lab Technician, etc.*

1. Describe the job in terms of its major duties (2 to 4).

Explain that this step requires a summarization of an employee's duties. This information may be taken from DPA general job descriptions. Use the following example or one of your own. For the job title "Foreman, Water and Sewer Systems" there exists the following job description:

Supervises crews engaged in installing, maintaining, operating, repairing, and servicing water treatment and/or distribution facilities. Requisitions materials and equipment. May prepare reports on manpower utilization, time records and material inventories. Reports utility activities to management level personnel. May also be engaged in similar work for other municipal public works departments.

This may be summarized on the Job Task Summary Sheet as:

A) Supervises installation, maintenance, repair and service of facilities.

B) Requisitions materials and equipment.

C) Prepares inventory, manpower and time reports.

D) Performs occasional duties for other departments.

2. Which duties are most relevant to the problem identified in the Problem Definition Worksheet? Circle the relevant items on the list above.

An identified problem should belong to one of the duties listed. In some cases more than one area may be involved. Participants should circle each relevant duty.

B. For each duty chosen as relevant to the identified problem, prepare a list of the specific tasks which make up the activities of that area. (Use additional pages if necessary to describe other areas/tasks.)

The following example is provided for your use. Consider supplying the duty and asking the participants to suggest tasks. You should not feel restricted to this example. Use any with which you and/or the workshop participants are familiar.

DUTY *Supervises installation, maintenance, repair and service of facilities*

Task 1) *Regular inspection of plant operation and maintenance*
2) *Organization and direction of the activities of the plant staff*
3) *Development of plans and procedures to ensure efficient operation and maintenance*
4) *Preparation of work schedules and staff shifting*
5) *Evaluation of operation and maintenance records*

C. Should all of the tasks under each duty be considered as subjects for training programs? Circle all the tasks which require training attention, given your definition of the problem. (In deciding whether a specific task should be the subject of a training program, consider its relative importance, frequency of performance, and overall difficulty.)

D. Complete a Task Detailing Sheet for each task to be considered as the focus of a training activity.

II. Presentation of Types and Levels of Behavior (lecture, 15 minutes)

Before proceeding to explain the Task Detailing Sheet (TDS), introduce the participants to the concepts of types and levels of behavior. Explain that it is necessary to understand these concepts in order to complete the TDS but that these types will be treated in more detail in Unit Four. For now, participants should use the definitions and explanations you give them to guide their decisions on the TDS.

A. Types of Behavior

Figure 3.8 *Use Figure 3.8 to define and differentiate among the three general categories of behavior.*

COGNITIVE

Actions which involve knowing, understanding or applying information; remembering or using facts or ideas.

AFFECTIVE

Expressions of feeling or interest; the adoption of an attitude or belief; the motivation to do something.

PSYCHOMOTOR

Physical action, speed or agility; the performance of a particular body movement.

It is likely that someone in the workshop will raise a question about a behavior or action which requires two or even all three types of behavior. Explain that many activities involve all three types of behavior to some degree. The task "check the filter" requires that the employee knows what should be done (cognitive), chooses to do it (affective), and physically removes and inspects the filter (psychomotor). However, in most training situations it is readily apparent that one type of behavior is the major concern. In this example the primary emphasis is on the cognitive behavior of knowing how to check the filter.

B. Levels of Cognitive Behavior

Figure 3.9 *Most training is concerned with cognitive behavior. However, not all cognitive behavior is alike. Introduce the participants to the four-level categorization*

of cognitive behavior shown in Figure 3.9. Once again, remind them that they will learn about these levels in more detail in the next unit.

Knowledge - ability to state a fact, symbol, definition, procedure, etc.

Comprehension - understanding the meaning of a piece of information; ability to explain or classify.

Application - using knowledge and comprehension to complete some activity; uses formula or rule, follows procedure.

Problem-solving - determining what must be done to perform some task - creates a procedure; combines rules or formulas into new rule.

III. Demonstration of the Use of the Task Detailing Sheet (demonstration, 20 minutes)

Figure 3.10 *Just as you went through each of the items on the JTSS, explain each of the steps in detailing a task. Participants will have copies of the TDS form (the same as Figure 3.10) in their reference manuals.*

TASK DETAILING SHEET

A. Write Job Title *(from A., Job Task Summary Sheet)*

B. Write Task *write the task from the JTSS which is to be considered as the focus of a training activity*

Complete steps C-F below.

C. List the specific steps required to perform the task.

Ask the participants to recall from Lesson One that a task usually consists of many steps. This stage of the task analysis process calls for a complete listing of the steps involved in completing a task which is to be taught to trainees. Most people at first have some difficulty determining exactly what a step is. Given the secretarial task "arrange a meeting of office managers", one analyst might list such steps as:

-compile/locate a list of those people who must attend the meeting

-call each person to determine his or her availability for a preferred and two alternate meeting times

-notify each person by phone call or memo of the confirmed date and time

Another less experienced analyst may include such detail as:

-find company directory

-look up name and number of office manager

-write it on a piece of paper

-dial number

-speak to person about meeting, etc., etc.

The selection of the appropriate level of detail is a factor of

1) the importance or criticality of the task,
2) the intricacy or level of difficulty of performing the task, and
3) the amount of practice a task analyst has had in detailing the steps of a task.

The participants should be encouraged to work with this process as they prepare instruction in their own job setting even if it seems awkward and not helpful at first. With repeated practice they should find the information very useful.

D. Check each step which needs to be taught.

Participants should be told that it is a somewhat subjective decision based on their estimations of the importance and level of difficulty of the tasks.

E. Indicate whether the checked steps primarily involve cognitive, affective, or psychomotor behavior.

F. For a cognitive behavior, indicate the appropriate level of performance:

Knowledge - ability to recall information or procedures

Comprehension - ability to explain information or procedures

Application - ability to use information or procedures to do something.

Problem Solving - ability to develop new information or procedures

At this point participants should complete these steps based on earlier information given in this lesson. Further understanding of the types and levels of behavior will be gained through exercises in Unit Four.

IV. Practice in Task Analysis (assignment and lecture, 30 minutes)

Handout 3.2,3.3 3.4

Hand out blank copies of the JTSS to all participants. Hand out sample job description. Have participants perform a Task Analysis on this job. Each person should work alone.

Circulate among the participants assisting when necessary. Keep people working through all of the steps making sure they don't spend too much time at any inappropriate point. End the exercise after twenty minutes.

Figure 3.11 3.12

Discuss the results obtained by the participants and use the prepared figures and handouts to show one possible response to this problem.

Handout 3.5,3.6

JOB TASK SUMMARY SHEET

A. Job Title____

1. Describe the job in terms of its major duties (2-4).

A) ____
B) ____
C) ____
D)____

2. Which duties are most relevant to the problem identified in the Problem Definition Worksheet? Circle the relevant items on the list above.

B. For each duty chosen as relevant to the identified problem, prepare a list of the specific tasks which make up the activities of that duty. (Use additional pages if necessary to describe other duties/tasks.)

DUTY ____

TASKS 1) ____________________________________
2) ____________________________________
3) ____________________________________
4) ____________________________________
5) ____________________________________
6) ____________________________________
7) ____________________________________

DUTY ____

TASKS 1) ____________________________________
2) ____________________________________
3) ____________________________________
4) ____________________________________
5) ____________________________________
6) ____________________________________
7) ____________________________________

C. Should all of the tasks under each duty be considered as subjects for training programs? Circle all the tasks which require training attention, given your definition of the problem. (In deciding whether a specific task should be the subject of a training program, consider its relative importance, frequency of performance, and overall difficulty.)

D. Complete a Task Detailing Sheet for each task to be considered as the focus of a training activity.

Figure 3.7/Job Task Summary Sheet

TYPES OF BEHAVIOR

COGNITIVE

Actions which involve knowing, understanding, or applying information, remembering or using facts or ideas.

AFFECTIVE

Expressions of feeling or interest, the adoption of an attitude or belief, the motivation to do something.

PSYCHOMOTOR

Physical action, speed, or agility, the performances of a particular body movement.

Figure 3.8/Types of Behavior

LEVELS OF COGNITIVE BEHAVIOR

1. **KNOWLEDGE** – Able to state a fact, symbol, definition, etc.
2. **COMPREHENSION** – Understanding the meaning of information, able to explain or clarify.
3. **APPLICATION** – Applying knowledge and comprehension to the completion of some activity, following procedures.
4. **PROBLEM-SOLVING** – Determining what must be done to perform some task.

Figure 3.9/Levels of Cognitive Behavior

TASK DETAILING SHEET

A. Write Job Title ______________________________

B. Write Task ______________________________

Complete steps C - F in the space below.

C. List the specific steps required to perform the task.
D. Check each step which needs to be taught.
E. Indicate whether the checked steps primarily involve cognitive, affective, or psychomotor behavior.
F. For a cognitive behavior, indicate the appropriate level of performance:
    Knowledge - ability to recall information or procedures
    Comprehension - ability to explain information or procedures
    Application - ability to use information or procedures to do something
    Problem Solving - ability to develop new information or procedures

C Steps Required to Perform Task	D Needs to be Taught	E Type of Behavior: Cognitive, Affective, Psychomotor	F Level of Cognitive Behavior: Know., Comp., Appl., P. S.
(1)			
(2)			
(3)			
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			
(11)			
(12)			

Figure 3.10/Task Detailing Sheet

JOB TASK SUMMARY SHEET

A. Job Title Chemist, Wastewater Treatment Plant

1. Describe the job in terms of its major duties (2-4).

   A) Supervises and/or [✓ performs tests] and sample collections
   B) Evaluates procedures and data, and interprets data
   C) Establishes test priorities and pilot research processes
   D) Consults with and advises operating personnel

2. Which duties are most relevant to the problem identified in the Problem Definition Worksheet? Circle the relevant items on the list above.

B. For each duty chosen as relevant to the identified problem, prepare a list of the specific tasks which make up the activities of that duty. (Use additional pages if necessary to describe other duties/tasks.)

DUTY performs tests

TASKS 1) [✓ performs suspended solids test]
2) performs pH test
3) performs Biochemical Oxygen Demand Test
4) performs residual chlorine test
5) (others)
6) (others)
7) (others)

DUTY ______

TASKS 1) ______
2) ______
3) ______
4) ______
5) ______
6) ______
7) ______

C. Should all of the tasks under each duty be considered as subjects for training programs? Circle all the tasks which require training attention, given your definition of the problem. (In deciding whether a specific task should be the subject of a training program, consider its relative importance, frequency of performance, and overall difficulty.)

D. Complete a Task Detailing Sheet for each task to be considered as the focus of a training activity.

Figure 3.11/Completed Job Task Summary Sheet

TASK DETAILING SHEET

A. Write Job Title Chemist, Wastewater Treatment Plant

B. Write Task Perform suspended solids test

Complete steps C - F in the space below.

C. List the specific steps required to perform the task.
D. Check each step which needs to be taught.
E. Indicate whether the checked steps primarily involve cognitive, affective, or psychomotor behavior.
F. For a cognitive behavior, indicate the appropriate level of performance:
    Knowledge - ability to recall information or procedures
    Comprehension - ability to explain information or procedures
    Application - ability to use information or procedures to do something
    Problem Solving - ability to develop new information or procedures

C Steps Required to Perform Task	D Needs to be Taught	E Type of Behavior: Cognitive, Affective, Psychomotor	F Level of Cognitive Behavior: Know., Comp., Appl., P. S.
(1) Gather equipment		Cognitive	knowledge
(2) Prepare filter	✓	Cognitive	application
(3) Measure sample	✓	Cognitive	knowledge
(4) Filter sample		Cognitive	knowledge
(5) Dry residue		Cognitive	knowledge
(6) Allow residue to cool		Cognitive	knowledge
(7) Weigh residue & filter	✓	Cognitive	application
(8) Record weight of residue		Cognitive	knowledge
(9) Repeat steps 5, 6, 7		Cognitive	knowledge
(10) Check consistency of weight of residue and filter	✓	Cognitive	application
(11) Calculate weight of residue	✓	Cognitive	application
(12) Record weight of residue		Cognitive	knowledge

Figure 3.12/Completed Task Detailing Sheet

UNIT THREE: TASK ANALYSIS
LESSON 2 of 2: USING THE JOB TASK SUMMARY SHEET AND THE TASK DETAILING SHEET

Handout 3.2: Job Task Summary Sheet

A. Job Title ______________________________

1. Describe the job in terms of its major duties (2-4).

A) ______________________________
B) ______________________________
C) ______________________________
D) ______________________________

2. Which duties are most relevant to the problem identified in the Problem Definition Worksheet? Circle the relevant items on the list above.

B. For each duty chosen as relevant to the identified problem, prepare a list of the specific tasks which make up the activities of that duty. (Use additional pages if necessary to describe other duties/tasks.)

DUTY ______________________________

TASKS 1) ______________________________
2) ______________________________
3) ______________________________
4) ______________________________
5) ______________________________
6) ______________________________
7) ______________________________

DUTY ______________________________

TASKS 1) ______________________________
2) ______________________________
3) ______________________________
4) ______________________________
5) ______________________________
6) ______________________________
7) ______________________________

C. Should all of the tasks under each duty be considered as subjects for training programs? Circle all the tasks which require training attention, given your definition of the problem. (In deciding whether a specific task should be the subject of a training program, consider its relative importance, frequency of performance, and overall difficulty.)

D. Complete a Task Detailing Sheet for each task to be considered as the focus of a training activity.

Handout 3.3: Task Detailing Sheet

A. Write Job Title ______________________________

B. Write Task ______________________________

Complete steps C - F in the space below.

C. List the specific steps required to perform the task.
D. Check each step which needs to be taught.
E. Indicate whether the checked steps primarily involve cognitive, affective, or psychomotor behavior.
F. For a cognitive behavior, indicate the appropriate level of performance:
    Knowledge - ability to recall information or procedures
    Comprehension - ability to explain information or procedures
    Application - ability to use information or procedures to do something
    Problem Solving - ability to develop new information or procedures

C Steps Required to Perform Task	D Needs to be Taught	E Type of Behavior: Cognitive, Affective, Psychomotor	F Level of Cognitive Behavior: Know., Comp., Appl., P. S.
(1)			
(2)			
(3)			
(4)			
(5)			
(6)			
(7)			
(8)			
(9)			
(10)			
(11)			
(12)			

UNIT THREE: TASK ANALYSIS
LESSON 2 of 2: USING THE JOB TASK ANALYSIS SHEET AND THE TASK DETAILING SHEET

Handout 3.4: Sample Job Description

Job Title: CHEMIST, WASTEWATER TREATMENT PLANT

Areas of Responsibility:	Supervises and/or performs specialized and complex chemical and physical tests and analyses of raw, partially treated, and treated wastewater and byproducts to determine efficiency of plant processes and insure that plant effluent meets local, state, and federal requirements. Conducts or supervises less complex routine tests. Supervises collection of laboratory samples. When laboratory technicians are present, supervises technicians and provides routine procedures to be followed. Evaluates and interprets test results, establishes test priorities, and prepares reports. Assembles data, maintains records, and prepares periodic reports. Sets up pilot processes when conducting research on improved procedures. Provides direct or indirect instructions to operating personnel regarding chemical requirements and adjustments, changes, or additions to various treatment processes.

Handout 3.5: Completed Job Task Summary Sheet

A. Job Title Chemist, Wastewater Treatment Plant

1. Describe the job in terms of its major duties (2-4).

A) Supervises and/or [✓ performs tests] and sample collections
B) Evaluates procedures and data, and interprets data
C) Establishes test priorities and pilot research processes
D) Consults with and advises operating personnel

2. Which duties are most relevant to the problem identified in the Problem Definition Worksheet? Circle the relevant items on the list above.

B. For each duty chosen as relevant to the identified problem, prepare a list of the specific tasks which make up the activities of that duty. (Use additional pages if necessary to describe other duties/tasks.)

DUTY performs tests

TASKS 1) [✓ performs suspended solids test]
2) performs pH test
3) performs Biochemical Oxygen Demand Test
4) performs residual chlorine test
5) (others)
6) (others)
7) (others)

DUTY

TASKS 1)
2)
3)
4)
5)
6)
7)

C. Should all of the tasks under each duty be considered as subjects for training programs? Circle all the tasks which require training attention, given your definition of the problem. (In deciding whether a specific task should be the subject of a training program, consider its relative importance, frequency of performance, and overall difficulty.)

D. Complete a Task Detailing Sheet for each task to be considered as the focus of a training activity.

UNIT THREE: TASK ANALYSIS
LESSON 2 of 2: USING THE JOB TASK SUMMARY SHEET AND THE TASK DETAILING SHEET

Handout 3.6: Completed Task Detailing Sheet

A. Write Job Title Chemist, Wastewater Treatment Plant

B. Write Task Perform suspended solids test

Complete steps C - F in the space below.

C. List the specific steps required to perform the task.
D. Check each step which needs to be taught.
E. Indicate whether the checked steps primarily involve cognitive, affective, or psychomotor behavior.
F. For a cognitive behavior, indicate the appropriate level of performance:
  Knowledge - ability to recall information or procedures
  Comprehension - ability to explain information or procedures
  Application - ability to use information or procedures to do something
  Problem Solving - ability to develop new information or procedures

C Steps Required to Perform Task	D Needs to be Taught	E Type of Behavior: Cognitive, Affective, Psychomotor	F Level of Cognitive Behavior: Know., Comp., Appl., P. S.
(1) Gather equipment		Cognitive	knowledge
(2) Prepare filter	✓	Cognitive	application
(3) Measure sample	✓	Cognitive	knowledge
(4) Filter sample		Cognitive	knowledge
(5) Dry residue		Cognitive	knowledge
(6) Allow residue to cool		Cognitive	knowledge
(7) Weigh residue & filter	✓	Cognitive	application
(8) Record weight of residue		Cognitive	knowledge
(9) Repeat steps 5, 6, 7		Cognitive	knowledge
(10) Check consistency of weight of residue and filter	✓	Cognitive	application
(11) Calculate weight of residue	✓	Cognitive	application
(12) Record weight of residue		Cognitive	knowledge

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT FOUR
OBJECTIVES SPECIFICATION - Unit Overview

Estimated time for unit - 4 hours (one hour of which may be assigned to be completed outside of class)

Overview

A crucial step in a systematic planning of instruction is the specification of the behaviors or competencies expected of those who receive the instruction. A trainer must be able to answer the questions "How will I know a participant has learned the material?" or, "What can I expect of one who has completed the instruction?" This unit will teach participants how to write learning objectives in behavioral terms. Using the information from the task analysis exercise, participants will learn how to specify objectives according to appropriate performance levels.

Entering Competencies

None required. But a familiarity with a model of a systematic approach to instruction and an understanding that a job is composed of duties (behaviors) is helpful.

Summary of Objectives

By the end of this unit the participants will be able to:
- define behavioral or instructional objectives
- list and explain the four components of a behavioral objective
- classify objectives according to level of behavior required
- write behavioral objectives according to the four-part format
- write behavioral objectives on more than one performance level.

Evaluation Activities

Peer review of objectives using rating form provided; short answer quiz.

References

Gronlund, N. E. Stating behavioral objectives for classroom instruction. New York: Macmillan, 1970.

Mager, R. F. Preparing instructional objectives. Belmont, CA: Fearon Publishers, 1962.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) Introduction to Instructional Objectives	Lecture; Assignment	45 min.	Content Outline Figure 4.1-4.6 Handout 4.1
2) Writing Instructional Objectives	Assignment	60 min.	Content Outline Handout 4.2
	Lecture; Guided Discussion	60 min.	Assignment 4.1
3) Levels of Objectives	Lecture; Assignments	75 min.	Content Outline Figure 4.7 Assignment 4.2

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 1 of 3: INTRODUCTION TO INSTRUCTIONAL OBJECTIVES

Estimated time: 45 minutes

Entering Competencies

None required. Familiarity with task analysis helpful.

Objective

Behavior By the conclusion of this lesson the participants will be able to: a) define the term "instructional objective," b) list four reasons why instructional objectives are important in the development of instruction, c) list three examples of objectives stated in vague terms, d) list three examples of objectives stated in explicit terms, and e) list three ways in which objectives differ from a task *Conditions* analysis by recall on a short-answer quiz. *Acceptable Performance* The participants will attain at least a score of seventeen out of a possible twenty points.

Justification

Participants should be provided with explanatory information about the nature and use of objectives before learning how to write them.

Evaluation Activities

Participants will complete a short answer quiz which addresses the objectives listed above. The instructor will correct the exams for review by the next lecture session.

Resources

Content Outline
Figure 4.1 Specify Instructional Objectives
4.2 Instructional Objectives
4.3 Importance of Objectives
4.4 Vague Terms
4.5 Explicit Behaviors
4.6 Task Analyses vs. Objectives
Handout 4.1 Short-Answer Quiz

Instructional Approach

This lesson is intended to answer three basic questions about instructional objectives:

1. What are they?

2. Why are they important?

3. How do they differ from a Task Analysis?

Begin by announcing that a short-answer quiz will be given at the end of this lesson to inform you, the instructor, as to how well the material is being learned. Using the figures provided, explain each of the points listed in the objectives statement above. Administer the quiz.

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 1 of 3: INTRODUCTION TO INSTRUCTIONAL OBJECTIVES

Content Outline

Estimated time: 45 minutes

I. Introduction to the Unit and This Lesson (lecture, 5 minutes)

Figure 4.1 *Introduce this unit by using Figure 4.1 to show what steps of the instructional design process have been completed and where this unit fits in. Then explain that the information specified on the Job Task Summary Sheet is to be directly applied to the writing of objectives. But first make sure that everyone has the same ideas about what an objective is and why it is important. Tell the participants that they will be given a brief quiz at the end of this lesson on the material you are about to present. Mention that the purpose of the quiz is for you to see how well the lesson is being learned so that you will know how to plan for the next lesson.*

II. Definition of an Instructional Objective (lecture, 5 minutes)

Figure 4.2 *Using Figure 4.2, define an instructional objective. Spend a minute or two stressing the concept of behavioral outcome. Use questions like "How will you know a learner has learned?" "What evidence will you accept that the student has learned?" or "What must a learner do to prove he or she knows the material?"*

A. Instructional Objective

A statement that describes an intended outcome of instruction. It describes a proposed change in a learner and it gives a description of a specific behavior or performance.

III. Importance of Objectives (lecture, 5 minutes)

Figure 4.3 *Explain the importance of objectives for someone who must plan or deliver instruction. Read and elaborate each item listed in Figure 4.3. Ask if the participants might suggest any other reasons why objectives are important.*

A. Importance of Objectives

1. Enable selection of the most appropriate lesson content for on-the-job training programs.
2. Permit selection of the most suitable instructional strategy.

3. Establish clear instructor and student goals.

4. Provide an objective basis for evaluating instruction.

IV. Vague vs. Explicit Behaviors (lecture, 5 minutes)

Using the examples provided, show the difference between vague unmeasurable terms and explicitly stated behaviors. Ask for additional examples.

Figure 4.4 A. Vague Terms

Know
Understand
Appreciate
Enjoy
Really Understand
Believe
Have Faith In
Fully Appreciate

Figure 4.5 B. Explicit Behaviors

Write
List
Solve
Construct
Compare
Contrast
Identify By Underlining

V. Task Analyses Are Not Instructional Objectives (lecture, 10 minutes)

Figure 4.6 A. Task Analyses Describe

1. Total job performance by a skilled person.

2. All skills required.

3. All job steps.

B. Objectives Describe

1. Only the performance to be learned through instruction.

2. Only skills to be learned through instruction.

3. Only steps to be learned.

Explain that while the performance steps which each participant listed on the Job Task Summary Sheet (Unit Three) are similar to objectives, they are in fact different.

1. A task analysis lists the performance expected of a worker who is skilled in the job. The instructional objective which would correspond to this performance specifies the behavior to be performed after a certain amount of instruction.

2. *A task analysis includes skills which are only performed after actual on-the-job practice. An objective only deals with a behavior which can be learned through instruction.*

3. *A task analysis gives a complete list of all of the steps which are performed to complete the task. Objectives are written for skills which the learner does not already possess. It does not include previously learned behavior.*

VI. Short Answer Quiz (assignment, 15 minutes)

Handout 4.1 *Distribute Handout 4.1. The participants should complete the answers without the use of notes or other aids in fifteen minutes or less. Collect the completed quizzes and correct them before the next scheduled session or while participants complete the reading during Lesson Two.*

ANSWER KEY

1. Define the term "instructional objective."

   a statement which describes an intended outcome of instruction; it describes a proposed change in a learner and it gives a description of a specific behavior or performance.

2. List four reasons why instructional objectives are important in the development of instruction.

   1. *allow selection of appropriate lesson content for on-the-job training.*
   2. *allow selection of suitable instructional strategies.*
   3. *establish clear instructor and student goals.*
   4. *provide an objective basis for evaluating instruction.*

3. List three examples of poorly defined behaviors.

   1.
   2. *know - understand - enjoy - appreciate - learn (etc.)*
   3.

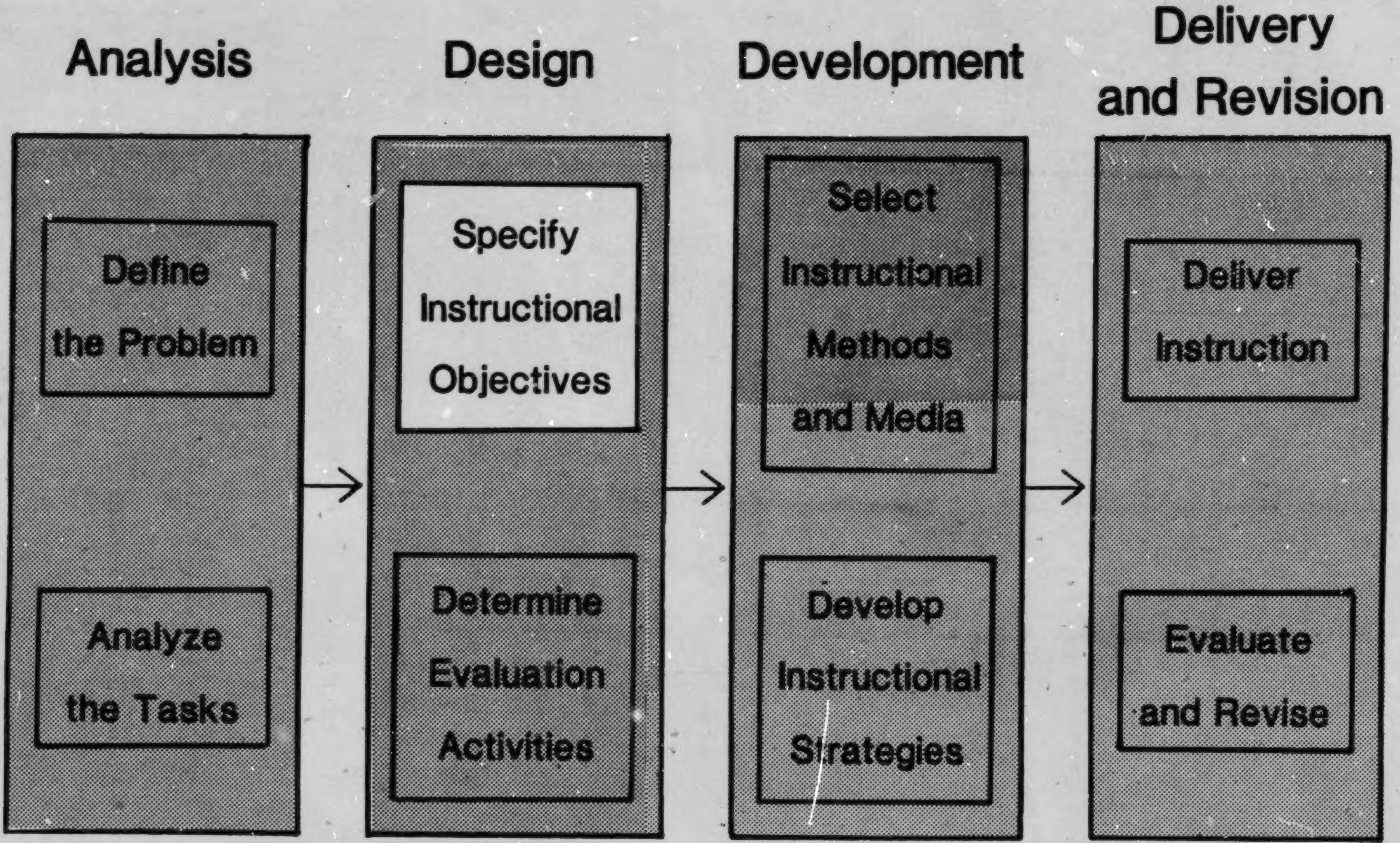
4. List three examples of explicitly defined behaviors.

   1.
   2. *write - list - name - recite - solve - manipulate - select (etc.)*
   3.

5. List three ways in which objectives are different from a task analysis.

	Task Analysis	*Objectives*
1.	*total job performance*	*performance to be learned*
2.	*all skills required*	*skills to be learned*
3.	*all job steps*	*steps to be learned*

THE INSTRUCTIONAL DEVELOPMENT PROCESS



Analysis

- Define the Problem
- Analyze the Tasks

Design

- Specify Instructional Objectives
- Determine Evaluation Activities

Development

- Select Instructional Methods and Media
- Develop Instructional Strategies

Delivery and Revision

- Deliver Instruction
- Evaluate and Revise

Figure 4.1/Specify Instructional Objectives

INSTRUCTIONAL OBJECTIVE

A statement that describes an intended outcome of instruction. It describes a proposed change in a learner and it gives a description of a specific behavior or performance.

Figure 4.2/Instructional Objective

IMPORTANCE OF OBJECTIVES

1. Enable the selection of the most appropriate lesson content for on-the-job training programs
2. Permit the selection of the most suitable instructional strategy
3. Establish clear instructor and student goals
4. Provide an objective basis for evaluating instruction

Figure 4.3/Importance of Objectives

VAGUE TERMS

KNOW

UNDERSTAND

APPRECIATE

ENJOY

REALLY UNDERSTAND

BELIEVE

HAVE FAITH IN

FULLY APPRECIATE

Figure 4.4/Vague Terms

EXPLICIT BEHAVIORS

WRITE

LIST

SOLVE

CONSTRUCT

COMPARE

CONTRAST

IDENTIFY BY UNDERLINING

Figure 4.5/Explicit Behaviors

TASK ANALYSIS DESCRIBES	OBJECTIVE DESCRIBES
1. Total job performance by skilled person	1. Performance learned through instruction
2. All skills required	2. Only steps to be learned
3. All job steps	3. Skills to be learned through instruction

Figure 4.6/Task Analyses vs. Objectives

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 1 of 3: INTRODUCTION TO INSTRUCTIONAL OBJECTIVES

Handout 4.1: Short-Answer Quiz

Answer the following questions in the space provided (15 min.)

1. Define the term "instructional objective".

2. List four reasons why instructional objectives are important in the development of instruction.

    1.

    2.

    3.

    4.

3. List three examples of poorly defined behaviors.

    1.

    2.

    3.

4. List three examples of explicitly defined behaviors.

    1.

    2.

    3.

5. List three ways in which objectives are different from a task analysis.

    1.

    2.

    3.

After the quiz has been corrected and returned to you, insert it in your Participant Reference Manual as the Content Summary for this lesson.

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 2 of 3: WRITING INSTRUCTIONAL OBJECTIVES

Estimated time: 120 minutes (60 minutes may be completed out of class)

Entering Competencies	Participants beginning this lesson should be able to define the term "Instructional Objective" and distinguish between vague and specific behavioral terms.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the end of this lesson the participants will be able to write instructional objectives according to the four-part format. The objectives will be complete and each of the four components will be written correctly according to guidelines given by the instructor.
Justification	The ability to specify the behavioral outcomes of instruction is a key skill in planning and preparing educational lessons and materials.
Evaluation Activities	Participants will review each other's objectives and score them according to the form provided.
Resources	Content Outline Handout 4.2 Objectives Score Sheet Participant Reference Manual Assignment 4.1 Writing Instructional Objectives
Instructional Approach	This lesson allows the participants to learn to write objectives at their own pace through the use of a self-instructional reading. The reading, which is located in the Participant's Reference Manual, includes: a. Instruction on writing objectives according to a four-part format b. A further explanation of the three-domain classification scheme first mentioned in Unit Three c. Practice in writing objectives including some which must be prepared to be corrected in class. The classroom segment of this lesson begins with a review of the quizzes taken as part of Lesson One. This is to be followed by a peer review of the instructional objectives written for class.

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 2 of 3: WRITING INSTRUCTIONAL OBJECTIVES

Content Outline

Estimated time: 120 minutes

I. Writing Instructional Objectives (assignment, 60 minutes)

Assign the participants to complete the self-instructional Assignment 4.1, "Writing Instructional Objectives", which is located in their reference manuals. If you are giving this as a take-home assignment, stress that it must be completed before the next class session because the objectives which they will write as part of this assignment will be used in the next class session.

II. Quiz Review (lecture, 15 minutes)

Return the quizzes taken at the end of Lesson One. Go over the answers briefly if the class as a whole did well, more extensively if they did not do well. Explain that the score they received is meant to give them some indication of how much they have learned or need to learn about objectives. The participants are not being graded.

III. Objectives Review (guided discussion, 45 minutes)

Handout 4.2 *Distribute Handout 4.2, Objectives Score Sheet. Have participants exchange the objectives they wrote as part of the assignment and rate their neighbor's objectives with the score sheet. Ask several participants to read the objectives they rated along with the scores they gave. Expect a lively discussion as people disagree over ratings. Go over any material in the reading which may not have been well-understood.*

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 2 of 3: WRITING INSTRUCTIONAL OBJECTIVES

RATING ______

Handout 4.2: Objectives Score Sheet

Rate the objectives written by another participant according to the outline below.

1. For what audience or type of worker is this objective intended?

   ____

2. State the behavioral term used. ______________________

   Explicit? ___Yes ___No. A better term would be ____________

3. What are the conditions under which the behavior is to be performed?

   ____

   Are the conditions clearly understandable? ___Yes ___No

   Are they complete? ___Yes ___No

4. Is the level of acceptable performance given? ___Yes ___No

   Write it here ______________________________________

   Does it demonstrate that the student has mastered the objective?

   ___Yes ___No

A - Five "yes" answers - excellent
B - Three or four "yes" answers - on the right track; need practice
C - Two or less "yes" answers - unsatisfactory; reread training material

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 3 of 3: LEVELS OF OBJECTIVES

Estimated time: 75 minutes

Entering Competencies	Participants beginning this lesson should be able to write instructional objectives according to the four-part format explained in Lesson 2.
Objective *Behavior* *Conditions* *Acceptable Performance*	After completing this lesson, participants will be able to write an instructional objective for a specific task step. Given a completed Task Detailing Sheet and a blank Lesson Planning Form, the participants will write a properly constructed objective of the same type and level as the task to be learned.
Justification	Participants must learn to write objectives at a performance level appropriate to the task.
Evaluation Activities	The instructor will review and critique the participants' work.
Resources	Content Outline Figure 4.7 Lesson Planning Form Participant Reference Manual Assignment 4.2 Types and Levels of Objectives Lesson Planning Form
Instructional Approach	The participants complete a self-instructional assignment on the three types of behavior (cognitive, affective, and psychomotor) and the four levels of cognitive behavior. The assignment directs them to practice writing objectives for each level. Then, after a brief presentation on the Lesson Planning Form by the instructor, the participants return to the simulated problem to write an instructional objective of the correct type and level.

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 3 of 3: LEVELS OF OBJECTIVES

Content Outline

Estimated time: 75 minutes

I. Types and Levels of Objectives (assignment, 45 minutes)

Have the participants read and complete the exercises in the self-instructional assignment 4.2 "Types and Levels of Objectives" which is located in the Participant Reference Manual.

II. Use of the Lesson Planning Form (lecture and assignment, 30 minutes)

A. Presentation of the form

Figure 4.7 *Use Figure 4.7 to display the Lesson Planning Form and explain that at this point the participants should be able to complete the items:*

LESSON PLANNING FORM

Job Title____________________________________

Task_______________________________________

Step____________________________ Level of Behavior_________
(if appropriate)

(1) Instructional Objective:

Audience_______________________________________

Behavior_______________________________________
____

Conditions______________________________________
____

Acceptable
Performance_____________________________________
____

B. Exercise in completing the Lesson Planning Form

Have the participants return to the problem introduced in Unit Two and the Job Task Summary Sheet and the Task Detailing Sheet they completed for that problem. Then have them fill out the above-mentioned items on the Lesson Planning Form in their reference manuals. While they are performing this exercise, look over the objectives written during the last exercise. Correct any misimpressions the participants may have about what the objectives should contain. Use any remaining time to answer any questions about objective writing or the lesson planning form.

LESSON PLANNING FORM

Job Title__________________________________ Task________________________

Step________________________

Type and Level of Behavior____
(as appropriate)

1) Instructional Objective:

Audience ____

Behavior ____

Conditions ____

Acceptable Performance ____

2) Entering Competencies: ____

3) Evaluation Activities:____

4) Instructional Methods: *Using the Instructional Methods Selection Table for guidance, choose the method or methods most suitable for reaching the objective and describe how it will be used.*

METHOD(s)____

5) Instructional Media. *Use the Media Selection Table to guide your choice of media for use in instruction. List all that apply.*

Appropriate Category of Media	Specific Medium & Title Available

6) Sequence of Instructional Activities. *Outline the specific activities which comprise the instructional approach.*

1.____

2.____

3.____

Figure 4.7/Lesson Planning Form

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT FIVE
EVALUATION TECHNIQUES - Unit Overview

Estimated time for unit - 4 hours

Overview

Evaluation is an important component of many training-related activities. Evaluation activities can be used by the instructor to motivate students, reinforce desired learning outcomes, and gather feedback on the progress and success of training programs. The techniques of evaluation are also essential tools for the assessment of employee job performance and training needs. This unit provides a basic introduction to the concepts and tools of evaluation. It also provides practice in the design of written test items, rating scales, and check lists.

Entering Competencies

Before beginning this unit, participants should be able to construct instructional objectives in behavioral terms and complete a task analysis.

Summary of Objectives

By the conclusion of this unit, participants will be able to:

- define evaluation and describe its uses in training-related activities
- describe the use of written tests, rating scales, and check lists
- construct multiple choice test items, short answer items and essay items
- construct check lists and rating scales.

Evaluation Activities

The instructor will have the opportunity to evaluate participant achievement on the unit's objectives through class discussion and performance on this unit's assignments in the Participant Reference Manual.

References

Butler, E. C. *Instructional systems development for vocational and technical training.* Englewood Cliffs, N.J.: Educational Technology, 1972.

Gronlund, N. E. *Preparing criterion-referenced tests for classroom instruction.* New York: Macmillan, 1973.

Popham, W. J. Criterion-referenced measurement.
Englewood Cliffs, N.J.: Prentice-Hall, 1978.

Popham, W. J., Baker, E. L. Systematic instruction.
Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) The Nature of Evaluation	Lecture, Guided Discussion, Assignment	90 min.	Content Outline Figure 5.1-5.10
2) Constructing Written Tests	Lecture, Guided Discussion, Assignments	115 min.	Content Outline Figure 5.11-5.16 Assignments 5.1, 5.2
3) Check Lists and Rating Scales	Lecture, Assignment	35 min.	Content Outline Figure 5.17-5.18 Assignment 5.3

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 1 of 3: THE NATURE OF EVALUATION

Estimated time: 90 minutes

Entering Competencies

Participants should be able to construct instructional objective in behavorial terms and complete a task analysis.

Objective

Behavior

Conditions

Acceptable Performance

Through this lesson, participants will be able to define evaluation and plan its use in support of training activities. Working with the Lesson Planning form and the information gained from the task analysis and instructional objective completed in Units Three and Four, participants will plan the use of evaluation activities (written tests, check lists, rating scales) and offer explanations of their decisions.

Justification

The evaluation of trainee or employee skills, knowledge and job performance is an important part of training activities. Evaluation may be used to define the need for training, and support or assess the achievement of training objectives. This lesson introduces the use of evaluation and three specific evaluation techniques.

Evaluation Activities

The instructor will review the evaluation activities specified by the participants on the Lesson Planning Form.

Resources

Content Outline
Figure 5.1 Unit Five Overview
5.2 Evaluation is...
5.3 Evaluation Involves...
5.4 Training-Related Uses of Evaluation
5.5 Evaluations Differ...
5.6 Specific Techniques
5.7 Types of Written Tests
5.8 Uses of Written Tests
5.9 Example Check List
5.10 Example Rating Scale

Instructional Approach

1. Begin the lesson by introducing the subject and organization of the unit and this particular lesson. The content outline and Figure 5.1 should be used to guide this presentation.

2. The main substance of the lesson should then be presented in two stages as indicated on the content outline. Using Figure 5.2-5.5, first define the nature and function of evaluation activities. (Work to remove any participant misunderstandings that training evaluation simply involves testing for grading purposes.)

3. The second section of the presentation focuses on the uses of specific evaluation techniques: written tests, rating scales, and check lists. Use Figure 5.6-5.10 to describe the nature and use of these techniques.

4. Conclude the lesson by having participants complete the "Evaluation Activities" portion of the Lesson Planning Form (in Unit Four of the Participant Reference Manual) and discuss their choices.

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 1 of 3: THE NATURE OF EVALUATION

Content Outline

Estimated time: 90 minutes

I. Introduction (lecture, 5 minutes)

Figure 5.1 *Introduce the unit by noting that evaluation is an important aspect of successful training programs. Use the unit overview to explain the content, outline, and general objectives of the unit's three lessons.*

II. Evaluation Defined (lecture, guided discussion, 35 minutes)

A. "Evaluation" can be defined in two ways: by what it is and what it does.

1. Evaluation IS:

Figure 5.2 a) Evaluation can be defined as a systematic process for collecting, analyzing, and preparing information to provide a careful description of the subject of concern. This descriptive information can then be used to reach judgments regarding the present or future worth of that subject.

Figure 5.3 b) This definition of evaluation indicates that evaluation involves both description and judgment.

i) Description provides information - a portrayal of the quality, characteristics or nature of some activity, program, etc.

ii) Judgment involves deciding upon the worth of one thing or activity relative to the worth of something else. It involves comparison.

-Comparison of one thing against similar things. (Example: comparing the performance of three new cars to decide which to buy.)

-Comparison of one thing against an absolute standard. (Example: judging cattle at the state on the extent to which each possesses certain ideal characteristics of weight, color, size, markings, etc.)

-Comparison of one thing against itself at a different point in time. (Example: a farmer's judgment of the quality of his crops before and after the application of a pesticide.)

2. Evaluation DOES:

Figure 5.4 a) Evaluation can also be defined by what it does - the specific functions it fulfills. For training programs, evaluation may serve four functions.

Figure 5.4

i) Determine existing capabilities of employees as a basis for identifying necessary training programs.
ii) Provide feedback to trainees during an instructional activity to let them know how they are progressing.
iii) Provide opportunities for trainees to practice using a new skill.
iv) Determine (or certify) the preparation of a trainee to do a particular job.

b) Examples

i) Discuss examples of each of the four uses of evaluation activities in training settings.

Figure 5.5

Note how each of the four types of training evaluation differ according to *who* *will use the information,* *what* *they want to know,* *why* *they want to know it,* *when* *they need to know it, and* *how* *certain they have to be about the accuracy of the results. As an example of these differences, note how the users of the evaluation information (the* *who**) include the instructor, the trainee, the managers and others.*

ii) Get participants to suggest a variety of different evaluation techniques that might be used in training settings. Ask them to think about all the different ways they as instructors might gather information about their trainees (e.g., evaluations of on-the-job performance, written tests, questionnaires, peer evaluations).

III. Written Tests, Rating Scales and Check Lists (lecture, guided discussion, 30 minutes)

A. Specific Techniques

Figure 5.6

Of the many different kinds of evaluation techniques, only a few of the most relevant ones for training purposes will be considered. Specifically:

1. Written tests - based on multiple choice, short answer, and essay items
2. Check lists and rating scales

B. Nature and Use of Written Tests

1. Nature

a) Written tests - the familiar "classroom" test.

Figure 5.7

b) May be based on any of the following formats:
-essays
-short answer (or "fill-in-the blank")
-multiple choice
-true/false.

2. Uses

Figure 5.8

a) Written tests are perhaps the most common form of instructional evaluation.
  i) They are a useful means of evaluating cognitive skills such as:
    -Knowledge
    -Comprehension
    -Application
    -Problem Solving
  ii) Written tests are also useful for providing
    -quick feedback to the instructor or trainee
    -a precise, fairly impartial record of trainee performance.

b) Written tests are frequently one of the easiest ways to evaluate training outcomes in the classroom, but they are usually not as good as direct evaluations of the trainees' actual on-the-job performance. However, if the required job performance can be duplicated in a written test, then a written test is all that is needed.

3. Examples

Have participants suggest examples of work-related job performance skills that could be adequately evaluated through some form of written test. Have them also suggest examples of job performance skills that could not be adequately evaluated through written tests in the classroom. Discuss the differences. (One obvious difference would be when the performance of the job requires the correct manipulation of specialized kinds of equipment.)

C. Nature and Use of Rating Scales and Check Lists

1. Nature

Figure 5.9 a) Check List: a list of skills or tasks which the trainee is expected to demonstrate in the satisfactory performance of a job. This is a very useful technique for evaluating a complex job when there is a specific series of steps to be completed.

Figure 5.10 b) Rating Scale: a list of skills or tasks with each so carefully defined as to permit the evaluator to judge the relative quality of the performance. This technique is useful when there is a concern for grading or ranking the relative quality of a performance.

2. Use

Check lists and rating scales are techniques for evaluating trainee (or employee) performance of a particular task, skill or procedure. They are particularly useful for evaluation of on-the-job performance. They enable the instructor and the trainee to see whether the "classroom learning" is correctly transferred to the real setting. They also enable the instructor to provide corrective feedback on task performance and/or certify trainee competence on a task.

3. Discussion

Compare the example check list and rating scale provided by Figure 5.9 and 5.10. Discuss the differences in the use of these techniques and in the kind of information they would provide the evaluator. Discuss how the use of both of these techniques differs from written tests.

IV. Evaluation Planning Assignment (20 minutes)

Using the Lesson Planning Form and the information gained through the task analysis and objectives specification exercises in the preceding two units, have participants decide on the appropriate evaluation activities (including, but not limited to, written tests, rating scales and check lists) for that particular training activity. Have participants fill in the "Evaluation Activities" portion of the Lesson Planning Form. Call on various participants at random to discuss their evaluation plans. Make suggestions where appropriate.

UNIT FIVE: EVALUATION TECHNIQUES

1. The nature of Evaluation
2. Constructing Written Tests
3. Checklists and Rating Scales

Figure 5.1/Unit Five Overview

EVALUATION

IS THE GATHERING OF INFORMATION

FOR DECISION-MAKING

Figure 5.2/Evaluation is the Gathering of Information for Decision-Making

EVALUATION INVOLVES

DESCRIPTION

COMPARISON

- Against similar things
- Against criteria/standards of quality
- Against the same thing at a different point in time

Figure 5.3/Evaluation Involves...

TRAINING RELATED USES OF EVALUATION

To determine existing capabilities of employees

To provide feedback to trainees

To provide practice of a new skill

To certify employee competencies

Figure 5.4/Training-Related Uses of Evaluation

EVALUATIONS DIFFER ACCORDING TO:

WHO needs to know something?

WHAT is it they want to know?

WHY do they want to know it ?

WHEN do they want to know it?

HOW CERTAIN do they have to be about the results?

Figure 5.5/Evaluations Differ According To:

SPECIFIC EVALUATION TECHNIQUES

-Written Tests

-Checklists and Rating Scales

Figure 5.6/Specific Techniques

TYPES OF WRITTEN TESTS

- Essays
- Short Answer
- True/False
- Multiple Choice

Figure 5.7/Types of Written Tests

USES OF WRITTEN TESTS

For evaluating cognitive skills:

- Knowledge
- Comprehension
- Application
- Problem Solving

To provide quick feedback

To provide an impartial performance record

Figure 5.8/Uses of Written Tests

EXAMPLE CHECK LIST: FOCUSING THE MICROSCOPE

Directions: Check each item only if performed properly. Check final square when each step has been performed properly and in correct sequence.

1. Snap low power objective into place ☐
2. Adjust mirror ☐
3. Assume starting point for focus ☐
4. Place slide on stage ☐
5. Adjust course adjustment screw to focus ☐
6. Change to high power ☐
7. Identify image on slide ☐
8. Correct sequence ☐

Figure 5.9/Example Check List

EXAMPLE RATING SCALE: WORKMANSHIP

Directions: Place an X on the line at the point which best describes this person on each dimension. You may check anywhere along the line.

1) Quality of Work

Sloppy

Average

Excellent

2) Care of Tools

Careless and Disrespectful

Average

Excellent

Figure 5.10/Example Rating Scale

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 2 of 3: CONSTRUCTING WRITTEN TESTS

Estimated time: 115 minutes

Entering Competencies

Participants should be able to define evaluation and plan its use in support of training activities.

Objective

Behavior
Conditions
Acceptable Performance

After completing this lesson, participants will be able to plan and construct simple written tests. Based on a statement of instructional objectives, the test will be designed to measure the achievement of those objectives with the individual items constructed according to the values for writing such items.

Justification

Instructors must be able to construct good written tests if they are to be able to assess the performance of trainees, to plan instruction or to judge its effectiveness. Well-designed tests can also be a powerful instructional tool that reinforces learning and provides opportunities for practice and corrective feedback to students.

Evaluation Activities

Quality of participant performance will be assessed and corrective feedback given on the responses to this lesson's assignment.

Resources

Content Outline
Figure 5.11 Steps in Test Design
5.12 Define Role and Function
5.13 Types and Levels of Behavior
5.14 Which Item Tests...?
5.15 Types of Test Items
5.16 Test Items Should...
Participant Reference Manual
Assignment 5.1 Constructing Multiple Choice Items
5.2 Constructing Short Answer Items

Instructional

Begin the lesson by pointing out that while instructional evaluation involves more than just tests, the ability to develop and use good tests in the classroom is the most important evaluation skill for instructors. Explain how testing can serve both instructional and assessment purposes.

Provide a brief overview of the lesson and then proceed with the following activities using the content outline, figures, and the assignment in the Participant Reference Manual.

1. Summarize the nature and use of written tests as described in Lesson 1 of this unit.

2. Present the "General Considerations in Test Design" using the content outline and Figure 5.11 - 5.14.

3. Discuss the various types of test items and the "Rules for Writing Objective Test Items" using the content outline and Figure 5.15 and 5.16.

4. Direct participants to complete Assignment 5.1 "Constructing Multiple Choice Items" in the Participant Reference Manual. Answer any questions that arise in the completion of this assignment.

5. Finally, have participants complete Assignment 5.2 "Constructing Short Answer Items" in the Participant Reference Manual. Review participant completion of both assignments as described in the content outline. Return the assignments to the students (before the end of the workshop) with constructive feedback on their items.

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 2 of 3: CONSTRUCTING WRITTEN TESTS

Content Outline

Estimated time: 115 minutes

I. Introduction (lecture, 5 minutes)

A. *Provide a brief overview of this lesson's objective and activities.*

B. *Introduce the subject of this lesson by reviewing the description of the nature and use of written tests as introduced in Lesson 1 (see Section III of Lesson 1 Content Outline).*

II. General Considerations in Test Design (lecture, discussion, 25 minutes)

A. Step One: Define the Intended Role and Function of Test

Figure 5.11

Figure 5.12

The first step in test design is to define the specific role and function of the test. Tests can differ greatly in their design depending upon who is to use the information they produce, what decisions they are intended to serve, and so on. The following questions can be used to define the role and function of written tests.

1. Who wants to know something?

-- The performance information gained from testing may be as important to the student as to the instructor. Testing activities may differ radically depending upon who is to use information.

2. What is it they want to know?

-- Will the test be designed to assess students' entering knowledge or progress through the course? Is it designed to formally certify or license the possession of certain skills and abilities?

3. Why do they want to know it?

-- Will the test be used by the instructor to grade or rank student performance? To provide corrective feedback to the student on the quality/correctness of his/her performance? To provide formative feedback to the instructor on the design and progress of the course?

4. When do they want to know it?

-- Quick, simple, "turn-around" of information during instruction? Measures over time to assess retention?

5. How certain do they have to be about the results?

   -- Testing for licensing or certification demands highly objective, reliable, and valid assessment information. At the other extreme, testing for self-assessment and corrective feedback does not need to provide the same quality of information.

Discuss with participants how the design of a test might change according to the responses to these five questions. You might also have participants suggest two widely different kinds of written tests with which they are familiar (e.g. Civil Service exams, college entrance exams, course exams and quizzes) and discuss how they are different answers to the five questions above.

B. Step Two: Define the Type of Behavior To Be Evaluated

Figure 5.12 The second step in test design involves defining the type of behavior to be evaluated. Test items should match the specific type and level of behavior you are concerned with measuring.

Figure 5.13

1. Cognitive
   - knowledge
   - comprehension
   - application
   - problem solving
2. Affective
3. Psychomotor

   (Explain that most of the training programs that participants will be involved with at this level are not likely to have important psychomotor objectives and their evaluation will not be considered here.)

Figure 5.14 *Discuss what it means to match the design of the test to the intended behavior. Use Figure 5.14 to illustrate positive and negative examples of the matching of a test item to the intended behavior. (The correct answer is "B".)*

C. Step Three: Planning the Content of the Test

1. In designing the test, consideration must also be given to the number and variety of items that will be included to measure each particular behavior; the more important a behavior is, the more items should be devoted to measuring its presence. ("Importance" can be judged from the objectives, or the information on the Job Task Summary Sheet.)

2. Finally, decisions must be made regarding what kind of test items to use: short answer, multiple choice, or essay.

Specific nature and use of each type of item is explained below. At this point just note that deciding on the type of items to use is an important part of test design.

III. Types of Test Items and Their Appropriateness For Written Tests In Most Training Situations (lecture, 15 minutes)

A. Types of Test Items:

Figure 5.15

Supply type	Selection type
-Short answer	-Multiple choice
-Essay	-Matching

Have participants describe examples of each type of item to make sure they understand the nature of each type of item.

B. Appropriateness of These Test Items

1. Short answer and multiple choice are generally the most efficient and objective test-item formats for most kinds of training situations.

2. Essay items are difficult to grade objectively. In addition, the quality of student performance on essay items is as apt to reflect verbal ability as subject-matter competence.

3. True-false items are useful in some limited situations, but generally not as good a test of student performance as multiple choice.

4. Matching items are simply a specialized form of multiple choice items for those situations which call for a comparison between sets of similar things.

IV. Rules for Writing Objective Test Items (lecture, 15 minutes)

Introduce this presentation by explaining that the following ten (10) rules apply to the design of any kind of written test item - multiple choice, short answer, or essay. Present the rules and discuss the meaning of each.

Figure 5.16

Test items should be written so that:

1. There is no doubt about the behavior that is to be performed. (Test items should be clear.)

2. They do not contain extraneous material. (Test items should be uncluttered.)

3. Irrelevant factors do not keep students from responding correctly. (Test items should be functional.)

4. They are at the proper level of difficulty.

5. They match the specific behavior of the performance objective.

6. There are enough items to thoroughly sample the trainees' performance of the intended behavior.

7. They provide a positive test of the desired behavior. (That is, for example, asking students to identify non-instances of a particular concept does not necessarily mean that they know the concept itself.)

8. The correct answer would be agreed upon by any expert. (Test items should have clearly correct answers.)

9. Irrelevant clues do not "give away" the correct answer.

10. One item should not "give away" answers to other items.

V. Constructing Multiple Choice and Short Answer Items (assignments, discussion, 55 minutes)

Direct participants to complete Assignment 5.1, "Constructing Multiple Choice Items", in the Participant Reference Manual. Note that there are two forms of the exercise which accompanies this lesson. One form is for Wastewater Treatment Facility Operators, and the other for Drinking Water Specialists. Note that they should complete the version of this exercise relevant to their background. Allow 25 minutes for completion of the assignment and the exercise and answer any questions that arise. Spend 5 minutes at the conclusion of the assignment discussing any problems that arise or reviewing selected answers on the exercise (but avoid any discussion of the technical content of the items).

Direct participants to complete Assignment 5.2, "Constructing Short Answer Items", in the Participant Reference Manual. Allow 20 minutes to complete the assignment and conduct a brief (5 minute) discussion of any difficulties with the reading or the exercise.

STEPS IN TEST DESIGN

1. Define intended role and function of test
2. Define type of behavior to be evaluated
3. Plan content of the test

Figure 5.11/Steps in Test Design

DEFINE ROLE AND FUNCTION OF TEST

1) WHO? Trainees? Instructor?

2) WHAT? Entering Knowledge? Progress?
   Certification?

3) WHY? Grades? Corrective Feedback?

4) WHEN? Before? During? After? Long after?

5) HOW CERTAIN? Very? Or just generally?

Figure 5.12/Define Role and Function

TYPES AND LEVELS OF BEHAVIOR

Cognitive

- Knowledge
- Comprehension
- Application
- Problem Solving

Affective

Psychomotor

Figure 5.13/Types and Levels of Behavior

WHICH ITEM TESTS FOR COMPREHENSION ?

A. How much dissolved oxygen is required to support life in a stream?

B. Explain how the level of dissolved oxygen in water can be changed.

Figure 5.14/Which Item Test

TYPES OF TEST ITEMS

Supply:

- Short Answer
- Essay

Selection:

- Multiple Choice
- Matching

Figure 5.15/Types of Test Items

TEST ITEMS SHOULD

1) Be clear
2) Be uncluttered
3) Be functional
4) Be at proper level of difficulty
5) Match the desired behavior
6) Thoroughly sample that behavior
7) Provide a positive test of that behavior
8) Have clearly correct answers
9) Not "give away" answer
10) Not "give away" answers to other items

Figure 5.16/Test Items Should...

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 3 of 3: CHECK LISTS AND RATING SCALES

Estimated time: 35 minutes

Entering Competencies	Participants will be able to plan and construct simple written tests before beginning this lesson.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson participants will be able to construct simple check lists and rating scales for evaluating performance. Working from task analysis information or statements of instructional objectives, participants will create check list and rating scale items that are clearly defined in terms of what is to be evaluated, and the standards to be used in judging the quality of the performance.
Justification	Rating scales and check lists are a useful means of evaluating observable behaviors and, specifically, the on-the-job performance of employees. Instructors may find them useful for evaluating trainee or employee performance to identify training needs or to provide corrective feedback.
Evaluation Activities	Participants will practice writing check list and rating scale items as part of the lesson's assignment and receive corrective feedback on their performance.
Resources	Content Outline Figure 5.17 Example Check List Figure 5.18 Example Rating Scale Participant Reference Manual Assignment 5.3 Constructing Check Lists and Rating Scales
Instructional Approach	Introduce the lesson and review its purpose and activities. Deliver the brief lecture on the nature and construction of check lists and rating scales using the content outline provided. Direct participants to complete Assignment 5.3 and then have them exchange their responses for peer review. Go over any problems or questions at the lesson's end and note that they will have a good deal of practice in using check lists and rating scales later in the workshop.

UNIT FIVE: EVALUATION TECHNIQUES
LESSON 3 of 3: CHECK LISTS AND RATING SCALES

Content Outline

Estimated time: 35 minutes

I. Introduction (lecture, 5 minutes)

Introduce the lesson and review its purpose and activities.

II. Nature and Use of Check Lists and Rating Scales (lecture, 5 minutes)

A. Check lists and rating scales are techniques for evaluating trainee (or employee) performance of a particular task, skill or procedure. They are particularly useful for evaluation of on-the-job performance. They enable the instructor and the trainee to see whether the "classroom learning" is correctly transferred to the real setting. They also enable the instructor to provide corrective feedback on task performance and/or certify trainee competence on a task.

Figure 5.17

B. Check List: a list of skills or tasks which the trainee is expected to demonstrate in the satisfactory performance of a job, behavior, etc. This is a very useful technique for evaluating a complex job when there is a specific series of steps to be completed.

Figure 5.18

C. Rating Scale: a list of skills or tasks, but with each so carefully defined as to permit the evaluator to judge the relative quality of the performance. This technique is useful when there is a concern with grading or ranking the relative quality of a performance.

Briefly compare the examples provided by Figure 5.17 and 5.18.

III. Constructing Check Lists and Rating Scales (lecture, 5 minutes)

General rules for constructing check lists and rating scales.

Review each carefully.

A. Define the behavior to be evaluated at an appropriate level of detail. Use statements of objective or task analysis information as the basis for this.

B. Determine standard for judgment of "good" performance.

1) Is the concern simply with the presence or absence of a specific behavior? If so, then a check list may be most appropriate.

2) Is the concern with rating or grading the quality of a behavior? If so, a rating scale is needed.

3) For a rating scale, specific attention must be given to defining the variations in the conduct of that behavior that will determine the relative quality of the performance.

C. Keep the check list and rating scale items simple and explicit. Do not construct items that require several simultaneous judgments about the behavior observed.

IV. Assignment (20 minutes)

Refer participants to Assignment 5.3 in the Participant Reference Manual and explain that they have ten minutes to complete the exercises. At the end of the assignment, have participants exchange papers to review the items they created. (You might suggest that reviewers attempt to complete the items as if they were actually evaluating someone's driving.) Discuss any problems or questions that arise.

EXAMPLE CHECK LIST: FOCUSING THE MICROSCOPE

Directions: Check each item only if performed properly. Check final square when each step has been performed properly and in correct sequence.

1. Snap low power objective into place ☐
2. Adjust mirror ☐
3. Assume starting point for focus ☐
4. Place slide on stage ☐
5. Adjust course adjustment screw to focus ☐
6. Change to high power ☐
7. Identify image on slide ☐
8. Correct sequence ☐

Figure 5.17/Example Check List

RATING SCALE: WORKMANSHIP

Directions: Place an X on the line at the point which best describes this person. You may check anywhere along the line.

Sloppy Worker	Average Worker	Excellent Worker
- Careless methods needs constant supervision	- Does good work but needs some supervision in caring for tools	- Works and cares for tools in a professional manner

Figure 5.18/Example of a Rating Scale

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT SIX
INSTRUCTIONAL METHODS AND MEDIA - Unit Overview

Estimated time for unit - 3 hours

Overview

Effective instruction requires more than specifying objectives and listing content topics. Instructors must also select appropriate methods to deliver the content and make the most efficient use of available media. This unit introduces the basic knowledge and skills needed to design effective instruction.

Entering Competencies

Before beginning this unit participants should be able to identify and analyze instructional problems, analyze tasks, specify behavioral objectives and select evaluation strategies.

Summary of Objectives

By the conclusion of this unit the participant will be able to:

-describe four types of instructional methods

-select instructional methods, using the Lesson Planning Form and Instructional Methods Selection Table

-list five categories of media and give at least two examples of each

-select instructional media using the Media Selection Table.

Evaluation Activities

Completion of the application exercise in lesson four will serve as the evaluation activity for this unit.

References

Gagne, R. M. & Briggs, L. J. *Principles of instructional design*. New York: Holt, Rinehart, and Winston, 1974.

Gerlach, V. S. & Ely, D. P. *Teaching and media: a systematic approach*. Englewood Cliffs, NJ: Prentice-Hall, 1971.

Popham, W. J. & Baker, E. L. *Systematic instruction*. Englewood Cliffs, NJ: Prentice-Hall, 1970.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) Introduction	Lecture	30 min.	Content Outline Figure 6.1, 6.2 Handout 6.1, 6.2
2) Four Types of Instructional Methods	Lecture; Guided Discussion	45 min.	Content Outline Figure 6.3 Participant Reference Manual
3) Selecting Instructional Methods and Media	Lecture Demonstration	45 min.	Content Outline Figure 6.4-6.6 Handout 6.3 Participant Reference Manual
4) Exercise in Selecting Methods	Individual Assignment/ Guided Discussion	60 min.	Assignment 6.1

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 1 of 4: INTRODUCTION

Estimated time: 30 minutes

Entering Competencies

Before beginning this lesson participants should be able to identify and analyze instructional problems, conduct task analyses, specify behavioral objectives, and select evaluation strategies.

Objective

By the conclusion of this lesson, participants
Behavior will be able to describe the process involved
in selecting instructional methods. Par-
Conditions ticipants will describe orally and without error
Acceptable Performance the activities by which appropriate methods and
sequences of methods are selected.

Justification

The selection of instructional methods is the logical result of the application of a series of steps that begins with problem analysis. Once participants know the procedure, they will be able to select effective appropriate instructional methods efficiently.

Evaluation Activities

A question-and-answer session at the end of the presentation will serve as the evaluation activity for this lesson.

Resources

Content Outline
Figure 6.1 Select Instructional Methods & Media
6.2 Instructional Methods Definition
Handout 6.1 Instructional Design Process
6.2 The Instructional Package Worksheet

Instructional Approach

This lesson consists of a lecture followed by a question-and-answer period. A content outline is provided; accompanying figures and handouts are keyed in the text.

1. Review the systematic approach to instruction, using Figure 6.1.
2. Review the relationship of the previous instructional decisions and the planning forms completed within units two through five. Relate the information contained on the planning forms to specific sections of the Instructional Package Worksheet. Distribute Handouts 6.1, 6.2.

3. Introduce the concept of "instructional method", using Figure 6.2. Briefly describe the two activities involved: identifying available resources and selecting methods.

4. During the question-and-answer period, ensure that participants understand in general the concepts just presented.

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 1 of 4: INTRODUCTION

Content Outline

Estimated time: 30 minutes

I. Instructional Decisions and the Systematic Approach (lecture, 10 minutes)

Figure 6.1 *Review the systematic approach from Unit One, focusing on the nature of the instructional decisions within each phase. Emphasize the linear relationships among the phases and decisions. Use Figure 6.1.*

A. The Systematic Process
Phase One: Analysis
1. Define the problem (Unit Two)
2. Analyze the tasks (Unit Three)

Phase Two: Design
3. Specify instructional objectives (Unit Four)
4. Determine evaluation activities (Unit Five)

Phase Three: Development
5. Select instructional methods and media (Unit Six)

B. Planning Forms

Handout 6.1,6.2 *Review the use of the various planning forms and introduce the final entries to be made on the Lesson Planning Form. Identify the entries on the IPW that correspond to Lesson Planning Form decisions. Distribute Handout 6.1, 6.2.*

1. Problem Definition Worksheet
2. Job Task Summary Sheet
3. Task Detailing Sheet
4. Lesson Planning Form
5. Instructional Methods Selection Table (to be introduced in Lesson 3)
6. Media Selection Table (to be introduced in Lesson 3)
7. Instructional Package Worksheet

II. The Development Phase (lecture and guided discussion, 20 minutes)

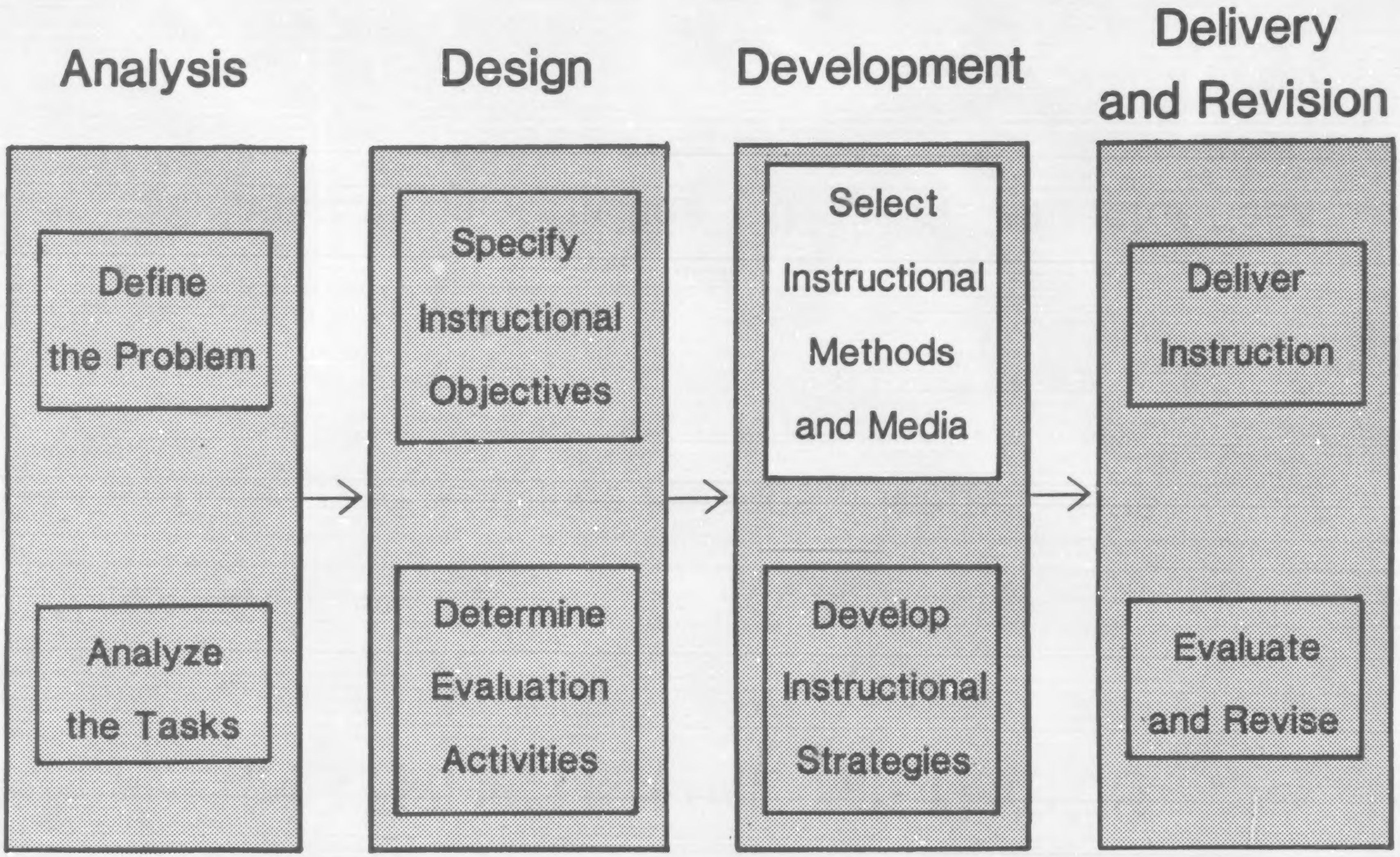
Figure 6.2 *Define "Instructional Method." Indicate that the instructor has determined what must be taught (instructional objectives); now s/he must decide how the content should be taught (instructional methods). Emphasize the importance of considering both the activities the instructor engages in and the activities the trainees engage in during learning. Discuss the need to select methods that are appropriate for both the objective and the available resources. Use Figure 6.2. During this period question the participants about their understanding of decisions to be made with the assistance of the planning forms provided.*

A. The Nature of Development
  1. Selection of means and ways of facilitating learning
  2. Learning activities and instructional activities
    a. learning activity: something a learner does to help him/her learn e.g., watches a demonstration, reads a manual
    b. instructional activity: something an instructor does to help trainees learn e.g., gives a lecture, assigns problems to be solved
  3. Instructional methods are ways of providing instructional activities and learning activities

B. Components of the Development Phase
  1. Identify and classify available resources
  2. Select instructional methods that are consistent with the types of available resources and with the type and level of desired behavior

C. Result of the Development Phase
  1. A set of instructional methods which lead trainees toward mastery of objectives
  2. A list of resources that are available for use during instruction

THE INSTRUCTIONAL DEVELOPMENT PROCESS



Analysis

Define the Problem

Analyze the Tasks

Design

Specify Instructional Objectives

Determine Evaluation Activities

Development

Select Instructional Methods and Media

Develop Instructional Strategies

Delivery and Revision

Deliver Instruction

Evaluate and Revise

Figure 6.1/Select Instructional Methods and Media

INSTRUCTIONAL METHODS

are ways of providing:

1. Learning Activities – things a learner does
   ("reads" "practices" "uses formula")

and

2. Instructional Activities – things an instructor does
   ("lectures" "demonstrates" "tutors")

that lead to mastery of objectives

Figure 6.2/Instructional Methods Definition

Handout 6.1 Instructional Design Process

Question	Phase	Steps	Forms	IPW
Who needs to do what?	Analysis	1. Define the Problem	Problem Definition Worksheet	
		2. Analyze the Tasks	Job Task Summary Sheet Task Detailing Sheet	
What must be done to show that the trainee has learned?	Design	3. Specify Instructional Objectives	Lesson Planning Form	"Objective= Behavior, Conditions, Acceptable Performance" "Entering Competencies" "Justification"
		4. Determine Evaluation Activities	Lesson Planning Form	"Evaluation Activities"
How should training be accomplished?	Development	5. Select Instructional Methods and Media	Lesson Planning Form Instructional Methods Selection Table Media Selection Table	
		6. Develop Instructional Strategies	Instructional Package Worksheet	"Resources" "Instructional Approach"
How effective is the training?	Delivery and Revision	7. Deliver Instruction	Instructional Package Worksheet	
		8. Evaluate/Revise	(All forms as needed)	

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 1 of 4: INTRODUCTION

Handout 6.2: The Instructional Package Worksheet

UNIT FOUR: OBJECTIVES SPECIFICATION
LESSON 3 of 3: LEVELS OF OBJECTIVES

Estimated time: 75 minutes

Entering Competencies	Participants beginning this lesson should be able to write instructional objectives according to the four-part format explained in Lesson 2.
Objective *Behavior* *Conditions* *Acceptable Performance*	After completing this lesson, participants will be able to write an instructional objective for a specific task step. Given a completed Task Detailing Sheet and a blank Lesson Planning Form, the participants will write a properly constructed objective of the same type and level as the task to be learned.
Justification	Participants must learn to write objectives at a performance level appropriate to the task.
Evaluation Activities	The instructor will review and critique the participants' work.
Resources	Content Outline Figure 4.7 Lesson Planning Form Participant Reference Manual Assignment 4.2 Types and Levels of Objectives Lesson Planning Form
Instructional Approach	The participants complete a self-instructional assignment on the three types of behavior (cognitive, affective, and psychomotor) and the four levels of cognitive behavior. The assignment directs them to practice writing objectives for each level. Then, after a brief presentation on the Lesson Planning Form by the instructor, the participants return to the simulated problem to write an instructional objective of the correct type and level.

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 2 of 4: FOUR TYPES OF INSTRUCTIONAL METHODS

Estimated time: 45 minutes

Entering Competencies

Before beginning this unit, participants should be able to specify instructional objectives from Job Task Summary Sheets and Task Detailing Sheets.

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson, participants will be able to describe four types of instructional methods. Participants will orally respond to the name of a method by giving a brief definition and a list of the advantages and disadvantages of employing each method.

Justification

Instructional methods have different degrees of effectiveness in different instructional environments. An understanding of the strengths and weaknesses of each method is important for trainees and teachers.

Evaluation Activities

Participant discussion will serve as the evaluation activity for this lesson.

Resources

Content Outline
Figure 6.3 Four Types of Instructional Methods
Participant Reference Manual
  Content Summary

Instructional Approach

This lesson contains two activities, a lecture on types of instructional methods and a discussion of the usefulness of each method in different instructional situations. A figure accompanies the presentation; its use is keyed in the Content Outline.

1. Review briefly the definition of "instructional method."
2. Present each type of method, using the Content Outline and Figure 6.3. Pause after each method for questions and comments.
3. Compare and contrast the four methods in terms of the appropriateness of each for different instructional situations. Refer participants to the Content Summary in their manuals.
4. Lead a brief discussion of the relative usefulness of each method for participants' own training situations.

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 2 of 4: FOUR TYPES OF INSTRUCTIONAL METHODS

Content Outline

Estimated time: 45 minutes

I. Four Types of Instructional Methods (lecture, 35 minutes)

Figure 6.3 *Present the four types of methods using Figure 6.3. Emphasize the strengths of each type in terms of the appropriateness of each for specific instructional situations, using the content outlined below.*

A. Four Types of Methods

1. Lecture
2. Demonstration
3. Guided Discussion
4. Adaptive Instruction
    a) Individualized Learning Packages
    b) Assignments
    c) Tutorials

B. Why Four Methods?

The four methods represent the four possible types of communication between instructors and learners

1. Lecture - communication of verbal information from instructor to learners
2. Demonstration - communication of verbal information and visual display of skills from instructor to learner
3. Guided Discussion - sharing of communication among instructor and learners
4. Adaptive Instruction - individual reception of communication from printed materials or from tutor

Refer the participants to the section of the Content Summary entitled "Four Types of Methods" in their reference manuals and explain each.

C. The Lecture (method #1)

1. definition - uninterrupted speech by which one presents information to others
2. characteristics of a good lecture
    a) the lecturer has good public speaking skills
    b) the presentation is
        i) brief - usually no more than 15-20 minutes of uninterrupted speech; a lecture snould not strain normal attention span
        ii) organized
            (a) the introduction

            - (1) establishes rapport between lecturer and learners
            - (2) defines the purpose of the lecture, gains learners' attention, and motivates them to remain attentive
            - (3) outlines the major points of the lecture
            - (4) defines the objectives of the lecture
        - (b) the body
            - (1) uses a simple-to-complex structure for presenting the content
            - (2) aims toward specific objectives
            - (3) provides opportunities for questioning
            - (4) allows for practice of knowledge
        - (c) the conclusion
            - (1) reviews and summarizes main points
            - (2) opens opportunity for student responses
            - (3) provides directions to the next activity
    - iii) accompanied by media (when appropriate)
        - (a) highlighting - visual accompaniments such as outlines, graphics, pictures - reinforce content during the lecture
        - (b) student handouts - "take-homes" such as outlines, procedural guidelines, etc. - serve as a personal employee manual for on-the-job use

3. advantages
    - a) presents large amounts of information from many or from hard-to-get sources in short amount of time
    - b) gives instructor control over the kind of information and organization presented
    - c) provides the most efficient way to introduce and to summarize a learning experience
4. disadvantages
    - a) over stresses acquisition of facts
    - b) can make learners into passive, dependent receivers of information
    - c) is instructor-paced
    - d) is often too long
    - e) is often over-used or misused
    - f) is not for teaching "how to" (procedures)
    - g) depends for success on instructor's public-speaking ability

D. Demonstration (method #2)

1. definition - showing, as opposed to telling, how to do something by manipulating appropriate materials and equipment
2. characteristics of a good demonstration
    - a) the instructor prepares site and materials
        - i) on-location or simulated site is chosen and prepared for maximum effectiveness and visibility to all learners

ii) materials and equipment obtained and tested by working through demonstration
iii) setup allows everyone to see demonstration
iv) media/handouts prepared to complement demonstration - i.e., steps outlined, decision points and criteria defined, "success" described in terms of predefined criteria

b) the instructor prepares for the students
i) necessary orientation information developed
ii) mini-lectures for introducing and summarizing the procedure prepared
iii) frequent opportunities provided to ask questions
iv) frequent checks to ensure student understanding
v) opportunities to practice the procedure

c) instructor follows up
i) reviews and evaluates student practice sessions
ii) reviews the procedure in other teaching situations

3. advantages
a) gives on-the-job experience
b) allows learners to develop and practice skills under supervision

4. disadvantages
a) not useful alone; must be prepared for and summarized through lecture or reading
b) large groups of learners require much time for practice in order to be effective
c) useful only for fixed-step procedures, not for creative problem solving
d) requires equipment, materials, often site visits

E. Guided Discussion (method #3)

1. definition - a sharing of ideas and opinions in order to arrive at a mutually acceptable decision or solution to a problem

2. characteristics of a good discussion
a) not a bull session - topics and objectives must be carefully prepared and purpose explicitly defined so that group will know when discussion should end
b) groups should be small enough to allow everyone to participate and large enough to avoid polarization or domination by a few
c) discussion leader
i) initiates discussion by stating topics, objectives, guidelines (rules for participating, perimeters of discussion)
ii) coordinates discussion by summarizing ideas and establishing relationships among ideas
iii) orients discussion by pulling discussion back to topic; avoids playing expert and giving lectures
iv) encourages participation by warmth, non-critical analysis of contributions, questioning silent members in non-threatening way

   - v) harmonizes the group by dealing with personal confrontations and disagreements and arbitrating as necessary
   - vi) gate-keeps by preventing anyone from dominating the group
 - d) participants
   - i) participate - purpose is to share ideas in order to develop solution to problem
   - ii) remain non-critical and objective - avoid personal attacks and emotional analyses like "that's stupid"
   - iii) stick to the topic
   - iv) avoid private discussions and share ideas with whole group
   - v) direct comments and questions to group rather than to leader
   - vi) accept leader as arbitrator of group
 - e) Physical environment is arranged to facilitate discussion by ensuring eye contact among all participants

3. advantages
   - a) allows all members of group opportunity to share ideas
   - b) provides for mutual solving of a problem and practice in ways of solving problems
4. disadvantages
   - a) can be dominated by an individual or faction
   - b) can degenerate into an exchange of abuse
   - c) can bog down in extended, uncomfortable silence or irrelevancies
   - d) can be a front for leader-provided lectures
   - e) can be misused (not suitable for communicating factual information or teaching procedures)

F. Adaptive Instruction (method #4)

1. definition - to adapt instruction to individual needs, goals, learning materials and/or instructional methods and techniques especially chosen to suit a particular student or group of students

   Types of adaptive instruction - individualized learning packages, assignments, tutorials
2. characteristics of good adaptive instruction
   - a) characteristics of effective individualized learning packages
     - i) provides all the information and materials learner needs to know on his/her own
     - ii) provides for practice and feedback
     - iii) is structured properly (orienting overview, body with logical learning steps, summarizing review)
     - iv) meets individual needs of learners
   - b) characteristics of effective assignments
     - i) application oriented - allows students to apply knowledge and skills in new or unfamiliar contexts

- ii) allows for choice - provides options so that the students can choose among alternative assignments, contexts, or subjects
- iii) builds skills in specific steps from simplest to most complex
- iv) provides feedback reinforcement

c) characteristics of effective tutorials
- i) is a one-to-one session between tutor and learner (tutor need not be the instructor)
- ii) has problem-solving orientation using stages of diagnosis and remedy
- iii) builds skills in specific steps
- iv) tutor guides learner to discover answers - does not lecture at learner
- v) session is problem-specific and ends when solution is discovered

3. advantages
   - a) responsive to individual needs
   - b) allows for learner pacing and repetition as desired
   - c) individualized learning packages can be given out when it is difficult to organize a class or too few students or no instructor available
   - d) tutorials can be used to help several learners with difficult problems in a short space of time
4. disadvantages
   - a) instructor-made individualized learning packages are expensive to prepare
   - b) not suitable for complex or complicated subject matter
   - c) not useful for teaching procedures that require equipment or complicated materials
   - d) does not allow for exchange of ideas and opinions - basically a lonely method of learning

II. Usefulness of Each Method for Training (guided discussion, 10 minutes)

Conduct a discussion of the relative usefulness of each method for the participants' own training situations.

FOUR TYPES OF INSTRUCTIONAL METHODS

Lecture

Demonstration

Guided Discussion

Adaptive Instruction

- Individualized Learning Packages
- Assignments
- Tutorials

Figure 6.3/Four Types of Instructional Methods

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 3 of 4: SELECTING INSTRUCTIONAL METHODS AND MEDIA

Estimated time: 45 minutes

Entering Competencies

Before beginning this lesson, participants should be able to describe four types of instructional methods.

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson, participants will be able to describe from memory the Instructional Methods Selection Table and the Media Selection Table and explain how the information obtained from these tables can directly inform decisions on the Lesson Planning Form. The participants will describe the tables in terms of the categories presented and that these categories have different applicability to each type and level of behavior.

Justification

Instructional methods must be directly derived from considerations about types and levels of behavior specified in objectives and the types of resources available for instructional use. The personal preference of the instructor is less important than considerations of objectives and resources.

Evaluation Activities

Application exercises in Lesson Four will serve as the evaluation activity for this lesson.

Resources

Content Outline
Figure 6.4 Lesson Planning Form
6.5 Instructional Methods Selection Table
6.6 Media Selection Table
Handout 6.3 Categories and Examples of Media
Participant Reference Manual
  Instructional Methods Selection Table
  Media Selection Table

Instructional Approach

This lesson consists of a demonstration of the procedure for selecting instructional methods and a discussion of its use. The use of the Media Selection Table is also described. Figures and tables accompany the content outline; their use is keyed in the outline.

1. Demonstrate the use of the Lesson Planning Form, the Instructional Methods Selection Table and the Media Selection Table (Figure 6.4 - 6.6; Handout 6.3; Tables are in Participant Reference Manual)
2. Discuss problems and concerns in using the table to select methods.

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 3 of 4: SELECTING INSTRUCTIONAL METHODS AND MEDIA

Content Outline

Estimated time: 45 minutes

I. Selecting Instructional Methods (lecture and demonstration, 35 minutes)

Figure 6.4 *Identify the decisions that must be made before methods can be selected; use Figure 6.4. Remind participants that they have already identified, on the Lesson Planning Form, the type and level of behavior specified by the objective.*

Describe briefly the procedure for using the Lesson Planning Form and the Instructional Methods Selection Table in the Participant Reference Manual to select appropriate methods.

A. In order to select a method or sequence of methods, the instructor must

1. identify the type and level of behavior specified in the objective

2. use the level and type of behavior to select a method from the Instructional Methods Selection Table

B. Considerations in Selecting Methods

1. Most instruction consists of a sequence of methods, each of which may have a relatively short duration. The sequence, which is designed to teach a single objective, constitutes a single lesson.

2. Trainees need opportunities to practice what they are learning. Application assignments, therefore, must form a large and significant part of successful instruction. Thus, most method sequences include frequent practice assignments and exercises, either in-class or take-home.

3. When more than one instructional method appears appropriate for a given instructional situation, the most efficient method in terms of preparation time, number of resources needed, and class size should be chosen.

C. Using the Instructional Methods Selection Table

Figure 6.5 *Demonstrate the use of the Instructional Methods Selection Table (Figure 6.5; also in the Participant Reference Manual). Enter the table by finding the row which represents the type and level of behavior of the objective to be achieved by the instruction. Use the information provided in the table to select the method or methods which are appropriate for the behavior to be learned.*

II. Selecting Instructional Media (lecture and demonstration, 10 minutes)

A. Categories of Media

Handout 6.3 *Distribute Handout 6.3, Categories and Examples of Media and quickly present the five categories with the examples of media given.*

B. Using the Media Selection Table

Figure 6.6 *Demonstrate the use of the Media Selection Table (Figure 6.6; also in Participant Reference Manual). Use the type and level of behavior to find information about appropriate categories of media. This procedure is similar to that used to select methods.*

C. Identify Specific Media Available

Explain that the medium or media selected as appropriate must be checked as to their availability. The task to be accomplished at this point in the development is to determine what specific titles or "pieces of media" are available from IRIS and other sources to which a trainer has access. Also part of this process is the determination of what simple media materials may be produced in-house or by some other local source. All of this information will, of course, be a factor in finally determining the Instructional Approach. Record the availability information on the Lesson Planning Form.

LESSON PLANNING FORM

Job Title Participants in the Basic Workshops Task Selection of Instructional Methods

Step Classifying Resources

Type and Level of Behavior cognitive: application
(as appropriate)

1) Instructional Objective:

Audience Participants in the Basic Workshops

Behavior will classify available instructional resources

Conditions Given a list of available resources and a classification scheme

Acceptable Performance With no errors

2) Entering Competencies: ________

3) Evaluation Activities: ________

4) Instructional Methods: *Using the Instructional Methods Selection Table for guidance, choose the method or methods most suitable for reaching the objective and describe how it will be used.*

METHOD(s) ________

5) Instructional Media. *Use the Media Selection Table to guide your choice of media for use in instruction. List all that apply.*

Appropriate Category of Media	Specific Medium & Title Available

6) Sequence of Instructional Activities. *Outline the specific activities which comprise the instructional approach.*

1. ________
2. ________
3. ________

Figure 6.4/Lesson Planning Form

INSTRUCTIONAL METHODS SELECTION TABLE

Instructional Method / Types of Behavior	LECTURE	DEMONSTRATION	GUIDED DISCUSSION	ADAPTIVE INSTRUCTION*
COGNITIVE, Knowledge	Appropriate for teaching facts	Generally not useful	Generally not useful	Useful and appropriate for conveying factual information
COGNITIVE, Comprehension	Appropriate	Useful as a supportive method to reinforce concept-using	Generally not useful	Appropriate
COGNITIVE, Application	Appropriate for initial presentation of rules	Most appropriate method for teaching rule-using	Generally not useful	Appropriate for initial presentation of rules
COGNITIVE, Problem-Solving	Generally not useful	Useful for problem-solving instruction	Useful and appropriate for developing problem-solving skills	Exercises are useful for teaching problem-solving
PSYCHOMOTOR	Useful only in support of a demonstration	Live or simulated demonstrations are the most effective method for teaching motor skills	Generally not useful	Useful only in support of a demonstration
AFFECTIVE	Usually not effective for motivating trainees or changing attitudes about something	Modelling and simulations are useful for forming attitudes	Group activities such as role-playing are often useful for attitude formation	Generally not useful

*Individualized Learning Packages; Assignments; Tutorials

Figure 6.5/Instructional Methods Selection Table

MEDIA SELECTION TABLE

Categories of Media

Types of Behavior	OBJECTS	STILL PICTURES	MOVING PICTURES	AUDIO MEDIA	WRITTEN MATERIALS
COGNITIVE Knowledge Comprehension Application Problem-Solving	Especially useful with demonstrations. Can be used to teach -recognition and discrimination -rules, principles or sequential steps.	Very useful for all levels of cognitive instruction. Can highlight stress concepts by displaying words. lists of steps, pictures and pictorial segments. Can provide visual cues.	Useful for showing content not otherwise easily brought into the training situation. Usually too costly for presenting still visuals and/or narrative audio.	May have their greatest use when in conjunction with printed matter or projected visuals. Useful if sounds of machines, alarms, etc. must be learned. Inexpensive.	Excellent media for all levels of cognitive instruction. Relatively inexpensive, printed materials allow for self-pacing. Can be used effectively with still pictures and audio materials.
PSYCHOMOTOR	Useful for teaching and trainee practice of performance in manipulating tools and equipment. Especially appropriate for on-the-job training. People can be used to demonstrate physical actions.	Little application. Can portray static positions of moving persons or objects.	Very useful. Can be used to: -model skills requiring motion -slow motion for close examination -provide visual feedback of student performance -demonstrate processes which take place over an extended time period.	Recorded audio materials generally useful in training only when demonstrating speech or hearing-related skills.	Limited application, since motion is difficult to represent. One important use is procedure guides or checklists for skills performance.
AFFECTIVE	Limited application. May be useful if the object is the focus of the desired attitude formation.	Limited application. Slides in combination with audio materials may influence attitude formation.	Excellent for influencing attitudes. Special effects and other visual techniques are especially useful for presenting affective material.	Limited application. Possibly useful for establishing moods or attitudes with background music, special sounds, or unique narration. May be used with slides to influence attitude formation.	Very little application for training materials.

Figure 6.6/Media Selection Table

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 3 of 4: SELECTING INSTRUCTIONAL METHODS AND MEDIA

Handout 6.3: Categories and Examples of Media

1. Objects

a) real things - provide an opportunity to see, feel, manipulate and use the actual objects connected with the specified objective
b) people - useful objects for instruction, especially in the psychomotor area
c) models - may be appropriate when real things are not readily accessible or are too big, small, complex or expensive

2. Still Pictures

a) flat pictures - especially useful for individual study
b) slides - may be used to project a high-quality picture for group use; also, individuals using a hand viewer
c) filmstrips - present a series of pictures in a fixed sequence
d) overhead transparencies - can project written material, artwork or a photograph with black lines or in color; can be "created" during the instruction
e) chalkboard - flexible and inexpensive way to present written material and simple illustrations
f) charts and posters - for simple instruction, reminders, or to gain attention. Flip charts may be especially useful for on-the-job training.

3. Moving Pictures

a) commercially-produced 16mm films - a highly attractive and attention-compelling medium, may be used to show motion, illustrate actual events and dramatically re-enact stories and events
b) single concept 8mm loop films - provide demonstrations of single skills, processes, events or ideas; are usually silent
c) locally produced films - offer many of the advantages of the films described above with the additional capability of presenting instruction tailored directly to instructional needs
d) instructional television - commercial broadcasts and professionally-produced tapes are similar to commercially-produced films; they can present more current events as well; videotape units can be used to record events or psychomotor behaviors and replay them immediately for instructional feedback.

4. Audio Media

a) people-instructors and students present information, hold discussions and provide feedback through the common act of speaking
b) professionally-produced audio materials - present professional musicians, poets, historians and other national or international figures for individual or group use

c) locally-produced audio materials - can present special instructions, guest presentations and student presentations; are flexible and inexpensive to use

5. Written Materials

a) text and reference books - present detailed information which is easily accessible and can be studied at an individual's own pace
b) workbooks - allow for practice of procedures and other learning events where learners can respond in writing to presented problems and often receive direct feedback immediately
c) periodicals - are especially useful for presenting current information
d) teacher-produced handouts - useful for supplying specific instructions on instructional activities and supplemented information; are also used to evaluate learning

UNIT SIX: INSTRUCTIONAL METHODS AND MEDIA
LESSON 4 of 4: EXERCISE IN SELECTING METHODS

Estimated time: 60 minutes

Entering Competencies	Before beginning this lesson, participants should be able to describe the characteristics, advantages, and disadvantages of the four instructional methods: lecture, demonstration, guided discussion, adaptive instruction; list the five categories of media and give at least two examples of each.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to select instructional methods, using the Lesson Planning Form and the Instructional Methods Selection Table. Given a Lesson Planning Form with specified objective and type and level of behavior identified, participants will identify appropriate instructional methods and media using the Tables provided.
Justification	The learning of new skills is most efficiently accomplished through supervised practice. This exercise provides an opportunity for participants to gain practice in using the Lesson Planning Form and Selection Table and makes more visible and clear to participants the linear relationships among the steps of task analysis, objectives specification, resource identification, and method and media selection.
Evaluation Activities	Successful mastery of this objective will be demonstrated through the application exercise during which participants will select instructional methods and media that are consistent with type and level of behavior.
Resources	Participant Reference Manual Assignment 6.1 Selecting Instructional Methods and Media
Instructional Approach	This lesson consists of an assignment in which participants will practice applying skills and knowledge developed through earlier lessons. The exercise involves completing a Lesson Planning Form from a prepared Task Detailing Sheet.

1. Refer participants to Assignment 6.1, Selecting Instructional Methods and Media in the Participant Reference Manual. Review the directions with participants. Instruct them to complete the Lesson Planning Form for a single Task Step on the Task Detailing Sheet. Inform them that they will have 45 minutes to complete the assignment. Remain available to provide guidance but give as little direct aid as possible.

2. After 45 minutes have elapsed, conduct a discussion of the participants' work and answer any questions they may have.

UNIT SEVEN
LESSON PLANNING - Unit Overview

Estimated time for unit - 3 hours 30 minutes

Overview

Lesson planning is the final stage in designing instruction. It involves the preparations for the actual delivery of the instruction to learners. This unit presents nine rules for making instruction effective and efficient and teaches participants to use the IPW as a plan for delivering instruction.

Entering Competencies

In order to complete this unit, participants should be able to identify instructional needs, analyze job tasks, write behavioral objectives, construct evaluation activities and select instructional methods.

Summary of Objectives

By the conclusion of this unit, participants will be able to

- describe the activities involved in completing an IPW
- apply the nine rules for the design of effective instruction
- complete an IPW for a lesson teaching a single objective.

Evaluation Activities

Mastery of unit objectives will be assessed on the post-test for Lesson Two and the application exercise in Lesson Four.

References

Popham, W. J., and Baker, E. L. Systematic instruction. Englewood Cliffs, NJ: Prentice-Hall, Inc. 1970.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
(1) Overview	Lecture	30 min.	Content Outline Figure 7.1 - 7.3 Handout 7.1
(2) Principles of Instruction	Individual Assignment	75 min.	Assignment 7.1
(3) Completing the the Instructional Package Worksheet	Lecture/ Demonstration	30 min.	Content Outline Figure 7.4 - 7.7 Handout 7.2

Lesson Title	Instructional Methods	Time	Support Materials
(4) Exercise in Planning a Lesson	Individual Assignment	60 min.	Assignment 7.2
(5) Planning for Other Levels of Instruction	Lecture	15 min.	Content Outline Figure 7.8 Handout 7.3

UNIT SEVEN: LESSON PLANNING
LESSON 1 of 5: OVERVIEW

Estimated time: 30 minutes

Entering Competencies

Before beginning this lesson, participants should be able to complete a Lesson Planning Form.

Objective

By the conclusion of this lesson, participants will
Behavior be able to describe the kinds of activities involved
Conditions in completing an Instructional Package Worksheet.
Participants will explain orally what activities are
Acceptable Performance involved in translating a Lesson Planning Form into
an Instructional Package Worksheet.

Justification

Between the stages of designing and implementing instruction lie a set of activities which are extremely important but often overlooked. Lesson planning involves an instructor in specifying explicitly the activities by which s/he will teach and students will learn. It is a blueprint for accomplishing instruction - a schedule of the activities and resources for mastering objectives.

Evaluation Activities

Participant discussion of the content will serve as the evaluation activity for this lesson.

Resources

Content Outline

Figure	7.1	Unit Seven
	7.2	Instructional Package Worksheet
	7.3	Purpose of Lesson Planning
Handout	7.1	The Instructional Package Worksheet as a Lesson Plan

Instructional Approach

This lesson consists of a lecture which provides an overview of the unit. A content outline is provided; accompanying figures and handouts are keyed in the text.

1. Review the lesson objective
2. Describe the structure and purpose of the unit; use Figure 7.1
3. Describe the structure and use of the Instructional Package Worksheet. Use Figure 7.2-7.3; distribute Handout 7.1.

UNIT SEVEN: LESSON PLANNING
LESSON 1 of 5: OVERVIEW

Content Outline

Estimated time: 30 minutes

I. Structure of Unit Seven (lecture, 5 minutes)

Figure 7.1 *Introduce the unit as the culmination of the study of instructional design. Inform participants that, by the end of the unit, they will be able to plan a lesson to teach a single objective. Describe the structure of the unit; use Figure 7.1.*

A. Lesson 1: Overview

Relationship between the Lesson Planning Form (LPF) and the Instructional Package Worksheet (IPW)

B. Lesson 2: Principles of Instruction

Nine Rules for Making Instruction Effective

C. Lesson 3: Completing the Instructional Package Worksheet

Describing entering competencies, a justification for the lesson, the instructional resources to be used, and the instructional approach to be followed

D. Lesson 4: Application Exercise

Completion of an IPW for a lesson

E. Lesson 5: Planning for Other Levels of Instruction

II. The Instructional Package Worksheet (lecture, 5 minutes)

Describe the contents and purpose of the Instructional Package Worksheet (IPW) as an example format for planning a single lesson. Review contents of entire IPW. Use Figure 7.2 and 7.3. Distribute Handout 7.1.

Figure 7.2 A. Components

B. Components that can be completed directly from the Lesson Planning Form

1. Objective

2. Evaluation Activities

C. Components that remain to be completed

1. Entering Competencies
2. Justification
3. Resources
4. Instructional Approach

III. The IPW as a Lesson Plan (lecture, 10 minutes)

Handout 7.1

A. A lesson plan describes in detail and in order what must be done in order to teach a single objective

B. A lesson plan specifies

1. what trainees will be able to do as a result of learning
2. why this particular skill or knowledge is important
3. how the learning will be assessed
4. what trainees must know or be able to do before they begin the lesson
5. what the instructor will do to help trainees learn
6. what materials and equipment the instructor will use to teach the lesson

IV. Purpose of a Lesson Plan (lecture, 10 minutes)

Figure 7.3

A. To get organized

Writing down exactly what you plan to do in the order you plan to do it helps you to organize the instruction. It helps you decide when to incorporate media, when to provide practice, and when and how to give feedback

B. To create a permanent record

Once written down, lesson plans are reusable; they can be shared with other instructors who must teach the same skills, thus helping to avoid needlessly "reinventing the wheel"

C. To answer demands for accountability

. A lesson plan is evidence of what happened during a lesson. It can help in the planning of future lessons by identifying instructional techniques that are effective or ineffective in particular situations

Discuss briefly with participants their conceptions of lesson planning and of the role of the IPW in preparing to teach a lesson.

UNIT SEVEN: LESSON PLANNING

1. The lesson planning form and the instructional package worksheet
2. Principles of instruction
3. Completing the IPW
4. Application exercise
5. Planning for other levels of instruction

Figure 7.1/Unit Seven Outline

INSTRUCTIONAL PACKAGE WORKSHEET

CURRICULUM:

COURSE:

UNIT:

LESSON:

Estimated time:

Entering Competencies

Objective

Behavior

Conditions

Acceptable Performance

Justification

Evaluation Activities

Resources

Instructional Approach

Figure 7.2/Instructional Package Worksheet

PURPOSE OF LESSON PLANNING

1. To get organized
2. To create a permanent record
3. To answer demands for accountability

Figure 7.3/Purpose of Lesson Planning

Handout 7.1: The Instructional Package Worksheet as a Lesson Plan

THE IPW AS A LESSON PLAN

A LESSON PLAN SPECIFIES:

1. WHAT TRAINEES WILL BE ABLE TO DO AS A RESULT OF LEARNING
   ---OBJECTIVE
2. WHY THE PARTICULAR SKILL OR KNOWLEDGE IS IMPORTANT
   ---JUSTIFICATION
3. HOW THE LEARNING WILL BE ASSESSED
   ---EVALUATION
4. WHAT TRAINEES MUST KNOW OR BE ABLE TO DO BEFORE THEY BEGIN THE LESSON
   ---ENTERING COMPETENCIES
5. WHAT THE INSTRUCTOR WILL DO TO HELP TRAINEES LEARN
   ---INSTRUCTIONAL APPROACH
6. WHICH MATERIALS AND EQUIPMENT THE INSTRUCTOR WILL USE TO TEACH THE LESSON
   ---RESOURCES

UNIT SEVEN: LESSON PLANNING
LESSON 2 of 5: PRINCIPLES OF INSTRUCTION

Estimated time: 75 minutes

Entering Competencies

Before beginning this lesson, participants should be able to describe the kinds of activities involved in completing an Instructional Package Worksheet.

Objective

By the conclusion of this lesson, participants will
Behavior be able to define and give an example of the application of each of the nine rules for effective
Conditions instruction. On a paper-and-pencil test, participants will select or create components of a hypo-
Acceptable Performance thetical lesson which exemplify the nine rules.

Justification

Research on teaching has revealed several principles for making instruction effective and efficient. An understanding of these principles will help instructors to plan good instruction.

Evaluation Activities

Completion of a written post-test will serve as the evaluation activity for the lesson.

Resources

Participant Reference Manual
   Assignment 7.1 Principles of Instruction

Instructional Approach

This lesson consists of an individual assignment.

1. Refer participants to the assignment package in their manuals. Make certain that they understand the directions. Allow 60 minutes for completion of the assignment which includes a post-test.

2. Discuss the assignment and the answers to the post-test with the participants. Answers will vary since the post-test involves individual choices of components for a lesson on writing behavioral objectives.

UNIT SEVEN: LESSON PLANNING
LESSON 3 of 5: COMPLETING THE INSTRUCTIONAL PACKAGE WORKSHEET

Estimated time: 30 minutes

Entering Competencies

Before beginning this lesson, participants should be able to describe the purpose of the Instructional Package Worksheet and identify its components, and list nine rules for designing effective instruction.

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson, participants will be able to describe the process of completing an Instructional Package Worksheet. Participants will list and explain the activities and considerations involved in translating a Lesson Planning Form into an Instructional Package Worksheet.

Justification

In order to implement a lesson, instructors must first specify the sequence of activities which they will use to teach the objective, list the materials and equipment needed to carry out those activities, describe the type of skills and knowledge trainees must have in order to be able to learn, and provide a rationale for learning the particular objective. These activities constitute the final step in preparing to teach a lesson.

Evaluation Activities

Oral descriptions of the process by which the Instructional Package Worksheet is completed constitute the evaluation activity for this lesson.

Resources

Content Outline
Figure 7.4 Completing an Instructional Package Worksheet
7.5 Sample Instructional Package Worksheet
7.6 Instructional Resources
7.7 Instructional Approach
Handout 7.2 Specifying the Resources and Instructional Approach

Instructional Approach

This lesson consists of a lecture/demonstration on completing an Instructional Package Worksheet for a lesson. A content outline is included; accompanying figures and handouts are keyed in the text.

1. Identify and explain each of the four components. Identify concerns in responding to each of the four. Distribute Handout 7.2.

2. Discuss the importance of review and revision.
3. Call on participants to review the concepts and procedures presented.

UNIT SEVEN: LESSON PLANNING
LESSON 3 of 5: COMPLETING THE INSTRUCTIONAL PACKAGE WORKSHEET

Content Outline

Estimated time: 30 minutes

I. Completing the Instructional Package Worksheet (lecture, 3 minutes)

Figure 7.4 *Review the components of the IPW and remind participants that the lesson objective and evaluation activity have already been described on the Lesson Planning Form; they must now be transferred to the IPW. Briefly describe the four components of the IPW yet to be completed. Explain that specification of the four components follows the nine rules participants have just studied. Use Figure 7.4.*

A. Specify the entering competencies

B. State the objective - from Lesson Planning Form (LPF)

C. Provide a justification for the objective

D. State the evaluation activities - from Lesson Planning Form (LPF)

E. List the resources needed to carry out instruction

F. Describe the instructional approach

II. Specifying Entering Competencies (lecture, 5 minutes)

Figure 7.5 *Explain the term "Entering Competencies"; describe how entering competencies are identified and how the instructor can ensure that trainees possess the necessary skills and knowledge. Demonstrate completing this section on the IPW. Use Figure 7.5. Remind participants that, on the Task Detailing Sheet, they had identified steps that do not need to be taught. Those steps, which represent knowledge and skills that trainees should already possess, can be specified as entering competencies.*

A. Definition - skills and knowledge that trainees must possess before they are ready to learn the behavior specified in the objective

B. Task analysis as means of determining pre-requisites

Use Task Detailing Sheet to identify skills and knowledge that trainees should already possess (Column D: steps that need *__not__* *be taught).*

C. Ensuring that trainees possess pre-requisite capabilities

1. pre-testing

2. remedial instruction

III. Stating the Objective (lecture, 3 minutes)

Figure 7.5 *Remind participants that they have already stated the objective on the Lesson Planning Form. They must now transfer that objective to the IPW. Demonstrate, using Figure 7.5.*

IV. Providing a Justification for the Objective (lecture, 5 minutes)

Figure 7.5 *Explain the concept "justification". Demonstrate the specification of a justification on the IPW. Use Figure 7.5.*

A. Provide a rationale for trainees which explains why the objective is important. The justification should refer directly to the occupational use of the skill or knowledge described in the objective.

B. Refer to Problems Definition Worksheet for rationale for the lesson.

V. Stating the Evaluation Activities (lecture, 2 minutes)

Figure 7.5 *Remind participants that they have already stated the evaluation activities on the Lesson Planning Form. They must now transfer those statements to the IPW. Demonstrate, using Figure 7.5.*

VI. Listing the Resources Needed to Carry Out Instruction (lecture, 5 minutes)

Figure 7.6 Handout 7.2 *Define "Resources". Demonstrate the process of identifying instructional resources. Remind participants that training materials must be prepared or obtained at this point. Use Figure 7.6; distribute Handout 7.2.*

A. Definition: anything an instructor or trainee uses during instruction is a resource.

B. In Unit 6 available resources were identified and used to select instructional methods. Those resources must now be matched with the activities they support and other necessary resources identified and prepared.

1. prepare content outlines for lectures
2. write specific questions for guided discussions
3. select/prepare instructional support materials
    a. figures, slides, films
    b. handouts
    c. demonstration materials and equipment

4. select/prepare trainee materials
   a. readings
   b. exercises
   c. worksheets
   d. tests
   f. procedural manuals

C. List resources on the Instructional Package Worksheet
   1. content outline/discussion questions
   2. figures
   3. handouts
   4. media (materials and equipment)

VII. Describing the Instructional Approach (lecture, 5 minutes)

Figure 7.7 *Describe the activities involved in specifying the Instructional Approach. Relate Methods Specification to activity descriptions; focus on describing activities in terms of what the instructor will do to help trainees master objectives. Relate the process to the nine principles of effective instruction. Use Figure 7.7.*

A. Definition: the sequence of activities which an instructor uses to teach a lesson

B. Methods and activities
   1. activities describe the means by which instructional methods are carried out e.g., if the method is lecture, the activities will be (1) delivers lecture, (2) shows figures on overhead projector, and (3) distributes handouts
   2. methods are the source of activities
   3. activities should be listed briefly, succintly, and in order

C. The process
   1. list activities in terms of the methods that have been selected
   2. for each method, identify all activities that will be needed to implement the method

3. describe the activities in terms of what the instructor must do.

Figure 7.5 *Demonstrate specifying resources and instructional approach on the IPW. Use Figure 7.5.*

VIII. Reviewing the Instructional Package Worksheet (lecture, 2 minutes)

Describe the review stage of planning. Emphasize the importance of revisions in the preparation for re-using IPW's.

A. Review the Instructional Package Worksheet prior to teaching the lesson to ensure that the IPW contains all information necessary to teach the lesson

B. Review the Instructional Package Worksheet after teaching the lesson

1. note any particular effective activities and materials

2. revise the Instructional Package Worksheet to eliminate/modify ineffective activities and materials

COMPLETING AN IPW

1. Specify entering competencies
2. Provide a justification for the objective
3. Describe the instructional approach
4. List the resources needed for the instructional activities

Figure 7.4/Completing an IPW

INSTRUCTIONAL PACKAGE WORKSHEET

CURRICULUM:

COURSE:

UNIT:

LESSON:

Estimated time:

Entering Competencies

Objective

Behavior

Conditions

Acceptable Performance

Justification

Evaluation Activities

Resources

Instructional Approach

Figure 7.5/Instructional Package Worksheet

INSTRUCTIONAL RESOURCES

For the instructor:

- Content Outlines
- Discussion Questions
- Figures
- Handouts
- Films and Slides
- Materials and Equipment for demonstrations

For the trainees:

- Readings
- Exercises
- Worksheets
- Tests
- Procedural Guides

Figure 7.6/Instructional Reso

INSTRUCTIONAL APPROACH

Instructional Methods are the source of Instructional Activities:

1. select methods (unit six)
2. for each method identify all activities needed to implement the method
3. describe activities in terms of what the instructor will do

Figure 7.7/Instructional Approach

UNIT SEVEN: LESSON PLANNING
LESSON 3 of 5: COMPLETING THE INSTRUCTIONAL PACKAGE WORKSHEET

Handout 7.2: Specifying the Instructional Approach and Resources

Specifying the Instructional Approach and Resources

1. select instructional methods
2. for each method, identify all activities needed to implement the method
3. describe the activities in terms of what the instructor will do
4. identify all resources needed to carry out the activities
   a. resources the instructor will use
   b. resources the trainees will use
5. obtain/prepare all materials
6. fill in "Instructional Approach" and "Resources" sections on IPW

UNIT SEVEN: LESSON PLANNING
LESSON 4 of 5: EXERCISE IN PLANNING A LESSON

Estimated time: 60 minutes

Entering Competencies

Before beginning this lesson, participants should be able to describe the procedures involved in planning a lesson and completing an IPW for a single instructional objective.

Objective

Behavior By the conclusion of this lesson, participants will be able to plan a lesson and complete an IPW for that lesson.
Conditions Given a completed set of instructional design forms,
Acceptable Performance participants will specify entering competencies, justification, an instructional approach, and resources to teach the lesson.

Justification

Practice is an important determinant of learning. This lesson provides participants with practice in planning a lesson.

Evaluation Activities

Completion of an IPW designed to teach a simple objective will serve as the evaluation activity.

Resources

Participant Reference Manual
Assignment 7.2 Exercise in Planning A Lesson

Instructional Approach

This lesson consists of an application exercise, which is the culmination of the simulation exercise begun in Unit 6.

1. Refer participants to the assignment for this lesson in their manuals. Describe the requirements of the exercise and the desired product. Review the directions.

2. Supervise participants during the exercise.

3. Discuss the finished products and any problems that arose during the exercise.

UNIT SEVEN: LESSON PLANNING
LESSON 5 of 5: PLANNING FOR OTHER LEVELS OF INSTRUCTION

Estimated time: 15 minutes

Entering Competencies	Before beginning this lesson, participants should be able to plan a lesson using the IPW.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to list and describe five levels of instruction and three planning levels for training programs from memory. All levels will be listed and described correctly as determined by the instructor.
Justification	This lesson serves to wrap up the first part of the training program and to lead into the second section, covering additional skills and knowledge that are important for trainees.
Evaluation Activities	No formal evaluation is required.
Resources	Content Outline Figure 7.8 Levels of Planning Handout 7.3 Levels of Planning
Instructional Approach	This lesson consists of a lecture. A content outline is provided; accompanying figures and handouts are keyed in the text. 1. Describe the five levels of planning and their relationships to jobs, tasks, and steps. Use Figure 7.8; distribute Handout 7.3. 2. Discuss ways of estimating the time allotment for each activity. 3. Describe the purpose of the next six units and the relationship between Units 2-7 and Units 8-13.

UNIT SEVEN: LESSON PLANNING
LESSON 5 of 5: PLANNING FOR OTHER LEVELS OF INSTRUCTION

Content Outline

Estimated time: 15 minutes

Figure 7.8 Handout 7.3 *Describe the relationship between levels of planning and levels of job, task, and step. Emphasize that most of the planning participants will be involved in will occur at the lesson level. Use Figure 7.8; distribute Handout 7.3.*

I. Levels of Planning (lecture, 10 minutes)

A. Levels of instruction

1. Curriculum - a particular course of study, often in a special field, which results in the attainment of a degree or a top position, such as Wastewater Treatment Operator. A number of courses or qualifications in several subordinate jobs are required to reach this goal.

2. Course - a body of prescribed studies or qualifications leading to certification. A course equates to a job description, which contains several major task components.

3. Unit - a single major topic within a course, which equates with a job task. Each unit is further divided into a series of objectives, the mastery of which adds a new component skill or knowledge.

4. Lesson - a single concept, procedure, or step, which must be mastered in order to complete a unit of instruction. A lesson must be completed in no more than a single class session.

5. Activity - a single event during instruction represented in the design as a method. A lecture or demonstration constitutes a single activity. A practice session is another activity. Activities are described in terms of what the instructor does. One or more activities in a specified sequence constitute a lesson.

B. Relevant planning levels for training programs

1. Unit plan - a schedule for accomplishing a major task. It generally outlines the goals of instruction and identifies component lessons in a sequence. It includes a description of the content and purpose of instruction, a list of necessary prerequisite skills and knowledge (entering competencies), a list in sequence of lessons and instructional methods, and an evaluation activity for the task. Several units are combined to teach an entire

job; each unit and its unit plan focus on one major task within the job.

2. Lesson plan - a schedule for accomplishing a subtask. The plan specifically identifies behavioral objectives and supporting activities, includes a rationale for the lesson, evaluation activities for each objective, necessary resources, and an estimated time allotment for achieving objectives. Each lesson provides activities for mastering one or more objectives of the unit.

3. Activity description - a description of each separate event during a lesson. Activities are described in terms of what the instructor does (e.g., gives a lecture, distributes handouts, shows a film).

Discuss some considerations in estimating time for activities. Call on participants to suggest others.

II. Estimating Time (lecture, 5 minutes)

A. Allow enough time for both instructional activities and trainee comments and questions.

1. Practice lectures and demonstrations; time them and add an additional 5-10 minutes for comments and questions.

2. Allow time for setting up equipment and for other management activities such as taking attendance and distributing materials.

3. Set firm time limits on discussions and make certain that trainees are aware of the limits.

B. Allow sufficient time during exercises for discussion on the effect of the exercise.

Review briefly the stages of the instructional design process and explain that this unit completes the study of that process. List the topics that remain in the workshop and inform participants that the skills they will gain through the next seven units will complement and reinforce skills gained thus far.

LEVELS OF PLANNING

Occupation/Position	Curriculum	
Job	Course	
Task	Unit	Unit Plan
Step	Lesson	Lesson Plan
	Activity	Activity Description

Figure 7.8/Levels of Planning

UNIT SEVEN: LESSON PLANNING
LESSON 5 of 5: PLANNING FOR OTHER LEVELS OF INSTRUCTION

Handout 7.3: Levels of Planning

A. Levels of Instruction

1. Curriculum - a particular course of study, often in a special field, which results in the attainment of a degree or a top position, such as Wastewater Treatment Operator. A number of courses or qualifications in several subordinate jobs are required to reach this goal.

2. Course - a body of prescribed studies or qualifications leading to certification. A course equates to a job description, which contains several major task components.

3. Unit - a single major topic within a course, which equates with a job task. Each unit is further divided into a series of objectives, the mastery of which adds a new component skill or knowledge.

4. Lesson - a single concept, procedure, or step, which must be mastered in order to complete a unit of instruction. A lesson must be completed in no more than a single class session.

5. Activity - a single event suring instruction represented in the design as a method. A lecture or demonstration constitutes a single activity. A practice session is another activity. Activities are described in terms of what the instructor does. One or more activities in a specified sequence constitute a lesson.

B. Relevant Planning Levels for Training Programs

1. Unit plan - a schedule for accomplishing a major task. It generally outlines the goals of instruction and identifies component lessons in a sequence. It includes a description of the content and purpose of instruction, a list of necessary prerequisite skills and knowledge (entering competencies), a list in sequence of lessons and instructional methods, and an evaluation activity for the task. Several units are combined to teach an entire job; each unit and its unit plan focus on one major task within the job.

2. Lesson plan - a schedule for accomplishing a subtask. The plan specifically identifies behavioral objectives and supporting activities, includes a rationale for the lesson, evaluation activities for each objective, necessary resources, and an estimated time allotment for achieving objectives. Each lesson provides activities for mastering one or more objectives of the unit.

3. Activity description - a description of each separate event during a lesson. Activities are described in terms of what the instructor does (e.g., gives a lecture, distributes handouts, shows a film).

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT EIGHT
DEVELOPING ORAL COMMUNICATION SKILLS - Unit Overview

Estimated time for unit - Two hours

Overview

An instructor is a public speaker, whether the speech is a lecture given to fifty people in a lecture hall or a few sentences of direction or encouragement given to one trainee during a problem-solving session. Since so much of what people learn is communicated orally, an instructor must be conscious of the way in which s/he delivers oral communications. This unit is designed to introduce characteristics of an effective oral presentation and to allow participants an opportunity to practice the techniques of effective oral presentations.

Entering Competencies

None.

Summary of Objectives

By the conclusion of this unit, participants will be able to:
- list characteristics of an effective oral presentation
- apply principles of effective speaking in a brief oral presentation
- evaluate the public speaking ability of fellow participants.

Evaluation Activities

Brief oral presentations by each participant will serve as the evaluation activity for this unit. The presentations will be judged in terms of characteristics identified during Lesson 1 of the unit.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
(1) Characteristics of an Effective Oral Presentation	Guided Discussion Lecture	30 min.	Content Outline Figure 8.1-8.3 Handout 8.1

Lesson Title	Instructional Methods	Time	Support Materials
(2) Exercise in Public Speaking	Participant Presentations	70 min.	Handout 8.2 Participant Reference Manual
(3) Summary	Guided Discussion	20 min.	Handout 8.1-8.2

UNIT EIGHT: DEVELOPING ORAL COMMUNICATION SKILLS
LESSON 1 of 3: CHARACTERISTICS OF AN EFFECTIVE ORAL PRESENTATION

Estimated time: 30 minutes

Entering Competencies

None

Objective

Behavior *Conditions* *Acceptable Performance*

By the conclusion of this lesson, participants will be able to list characteristics of an effective oral presentation and identify some common mistakes in giving oral presentations. Given a list of both ineffective and effective techniques and mannerisms, participants will separate those which increase presentation effectiveness from those which decrease or prevent effectiveness.

Justification

The most efficient means of communicating information to large groups in a short time is the lecture. However, lecturing is more than merely the delivery of information. To be effective, the lecture must combine a well-organized and attractive content with skill in public speaking. The lecturer must be able to speak in a relaxed and informal manner, with clear and varied voice tones and diction, and in language relevant to the audience. This lesson introduces techniques for successful oral presentation of lectures.

Evaluation Activities

Participant understanding of the content of this lesson will be evaluated during the next lesson.

Resources

Content Outline
Figure 8.1 Spoken Delivery
8.2 Non-distracting Delivery
8.3 Organized Delivery
Handout 8.1 Characteristics of an Effective Oral Presentation

Instructional Approach

This lesson consists of two activities, a guided discussion and a lecture. Figures and handouts accompany the presentation; their use is keyed in the content outline.

1. Introduce this unit as a change in the focus of the workshop; having learned how to plan instruction, participants will now gain experience in presenting instructional content.

2. Introduce the guided discussion question and solicit responses.

3. Present the rules for effective public speaking, using Figure 8.1-8.3. Distribute Handout 8.1.

UNIT EIGHT: DEVELOPING ORAL COMMUNICATION SKILLS
LESSON 1 of 3: CHARACTERISTICS OF AN EFFECTIVE ORAL PRESENTATION

Content Outline

Estimated time: 30 minutes

I. Introduction (lecture, 5 minutes)

Briefly define the goals of the unit. Explain that units Two through Seven developed skills in designing and planning instructions; Unit Eight now focuses on necessary skills for presenting content in oral forms such as lecture. Emphasize the importance of the ability to speak in a relaxed and effective manner. Inform participants that they will put into practice skills gained through all eight units during their formal oral presentations in Units Nine and Twelve.

II. Guided Discussion Question (guided discussion, 15 minutes)

You have all listened to speeches and presentations by teachers and public speakers that were memorable because they were very good or very bad. What aspects of those presentations do you recall as being particularly effective or ineffective?

Begin the discussion by asking participants to recall teachers and public speakers whose oral presentation abilities were memorably good or bad. Ask them to describe the lecturers and speakers they recall, identifying aspects of the oral presentations considered particularly effective or ineffective. Be careful not to let the discussion descend into a mere anecdote-telling session. Allow 15 minutes for the discussion.

III. Lecture: Rules for Effective Public Speaking (lecture, 10 minutes)

Figure 8.1, 8.2, 8.3 Handout 8.1

Formally present the rules for effective public speaking given below. Whenever possible, tie the rule to the previous discussion. Use Figure 8.1-8.3 to emphasize the rules. Inform participants that the handout for this lesson can serve as a checklist for evaluating their own and others' presentations. Stress the informality of training program lectures and the need for instructors to be alert for and responsive to trainees' questions during the presentation. Distribute Handout 8.1.

A. Oral presentations must be spoken, not read.

1. Maintain eye contact with audience.

2. Use humor to establish and maintain rapport with audience.

3. Use a variety of voice tones and volumes.

4. Create an atmosphere of informality by appearing relaxed.
5. Use language that is appropriate for the audience.
6. Check frequently to determine degree of audience interest and understanding.
7. Allow space for occasional questions and comments from audience.
8. Show enthusiasm for the topic.

B. The speaker's body must not distract from the content of the presentation.

1. Be poised; do not pace around, shuffle feet or papers, or wave hands.
2. Have all equipment and materials ready and organized before beginning.
3. Always face your audience, even when using media.
4. Keep your hands still when not demonstrating a procedure or pointing to an item in the media.

C. The presentation must be organized and logical.

1. Orient the audience to provide motivation for listening.
2. Inform the audience of the structure of the presentation.
3. Emphasize major points - with media as appropriate.
4. Summarize major points at the end.

I. SPOKEN DELIVERY

1. Eye Contact
2. Humor
3. Variety
4. Informality
5. Appropriate Language
6. Check Audience
7. Audience Participation
8. Enthusiasm

Figure 8.1/Spoken Delivery

II. NON–DISTRACTING DELIVERY

1. Poise
2. Organized Materials
3. Face Audience
4. Quiet Hands

Figure 8.2/Non-Distracting Delivery

III. ORGANIZED DELIVERY

1. Orientation
2. Structure
3. Emphasis
4. Summary

Figure 8.3/Organized Delivery

Handout 8.1: Characteristics of an Effective Oral Presentation

CHARACTERISTICS OF AN EFFECTIVE ORAL PRESENTATION

I. A spoken presentation or delivery style.

Oral presentations must be spoken, not read.

1. Maintain eye contact with audience.
2. Use humor to establish and maintain rapport with audience.
3. Use a variety of voice tones and volumes.
4. Create an atmosphere of informality by appearing relaxed.
5. Use language that is appropriate for the audience..
6. Check frequently to determine degree of audience interest and understanding.
7. Allow space for occasional questions and comments from audience.
8. Show enthusiam for the topic.

II. A non-distracting delivery.

The speaker's body must not distract attention from the content of the presentation.

1. Be poised; do not pace around, shuffle feet or papers, or wave hands.
2. Have all equipment and materials ready and organized before beginning.
3. Always face your audience, even when using media.
4. Keep your hands still when not demonstrating a procedure or pointing to an item in the media.

III. An organized delivery.

The presentation must be organized and logical.

1. Orient the audience to provide motivation for listening.
2. Inform the audience of the structure of the presentation.
3. Emphasize major points - with media as appropriate.
4. Summarize major points at the end.

UNIT EIGHT: DEVELOPING ORAL COMMUNICATION SKILLS
LESSON 2 of 3: EXERCISE IN PUBLIC SPEAKING

Estimated time: 70 minutes

Entering Competencies

Participants should be able to identify techniques for making oral presentations.

Objective

By the conclusion of this lesson, participants will be able to :

Behavior
Conditions
Acceptable Performance

1. apply principles of effective speaking in a brief oral presentation. Given an outline of a topic familiar to them, participants will deliver a 4-5 minute lecture on the content. They will demonstrate, through their presentations, all principles for effective public speaking.

Behavior
Conditions
Acceptable Performance

2. evaluate the public speaking ability of fellow participants using the rating scale provided. Each participant will evaluate the presentation of each member of the group as well as him/herself.

Justification

In order to learn new skills, participants must be able to practice those skills. Moreover, since public speaking involves an audience, this lesson provides both practice in the skills of public speaking and an audience to receive and evaluate the presentation.

Evaluation Activities

Using the rating scale participants will evaluate the presentations for skill in posture, composure, and verbal fluency.

Resources

Handout 8.2 Presentation Rating Scale
Participant Reference Manual
    Content Outline: Four Instructional Methods

Instructional Approach

The activity in this lesson is an exercise during which participants practice correct public speaking skills. Familiar content is provided in the form of the lecture outlines for four instructional methods from Unit Six reprinted in the Participant Reference Manual. Participants can concentrate on the skills for the presentations rather than on the content. The class should be reminded that they will be using these skills in later units of the Workshop.

1. Introduce the goal and purpose of the lesson. Divide the class into groups of four and distribute the handout. Each participant should have as many copies as there are members in his/her group. Inform participants that they will evaluate the public speaking skills of both fellow group members and themselves, following each presentation, by filling out a rating scale. Allow group members to select the lecture outline each wishes to use for his/her own presentation. Then allow 10 minutes for preparation. If possible, assign groups to separate rooms; at least ensure that groups are sufficiently separated so that sounds from one group do not disturb another.

2. Supervise groups as presentations are made. Ensure that each presentation is 4-5 minutes long and that time is allotted for completion of the rating scale at the end of each presentation. This activity should take approximately 30 minutes.

3. After all presentations have been given, each group should review them together and provide oral critiques of each other's presentations. Each participant should then gather together the rating scale evaluating his/her own presentation. Allow approximately 25 minutes for this activity. Ensure that evaluative comments are positive and constructive and do not degenerate into personal comments.

UNIT EIGHT: DEVELOPING ORAL COMMUNICATION SKILLS
LESSON 2 of 3: EXERCISE IN PUBLIC SPEAKING

Handout 8.2: Presentation Rating Scale

Name of Presenter________________________________Topic____________________

Directions: The following are some important characteristics of good instructional presentations. Check the column on the right that best represents your impression of this presenter's performance on each characteristic. Do not complete the form until the presentation is over. It should only take a few minutes to complete this form. Remember that the purpose of this rating scale is to provide corrective feedback to the presenter.

	Excellent	Very Good	Adequate	Poor	Does not Apply
A. Delivery Techniques					
1. Obtained the attention of the audience at the start	____	____	____	____	____
2. Attempted to match the presentation to the audience's background and preparation	____	____	____	____	____
3. Projected warmth, friendliness, confidence, and interest in the subject	____	____	____	____	____
4. Talked with sufficient volume to reach all listeners.	____	____	____	____	____
5. Varied stress, intonation and pacing as appropriate	____	____	____	____	____
6. Used humor when appropriate	____	____	____	____	____
B. Composure					
7. Maintained relaxed posture during the presentation	____	____	____	____	____
8. Refrained from pacing or shuffling feet	____	____	____	____	____
9. Used no distracting mannerisms	____	____	____	____	____
C. Organization					
10. Began with a clear introduction, including purpose and overview	____	____	____	____	____
11. Provided clear and useful organization for material	____	____	____	____	____
12. Emphasized and/or repeated important points	____	____	____	____	____
13. Incorporated examples and illustrations	____	____	____	____	____
14. Allowed for audience feedback through questions and comments	____	____	____	____	____

Use the back of this form for any additional comments or suggestions you might wish to make.

UNIT EIGHT: DEVELOPING ORAL COMMUNICATION SKILLS
LESSON 3 of 3: SUMMARY

Estimated time: 20 minutes

Entering Competencies	Participants should be able to identfy effective techniques in oral presentations and to evaluate presentations using the Presentation Rating Scale.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to evaluate their own level of skill in public speaking. Having just completed an oral presentation and having rated themselves and each other, participants will identify perceived strengths and weaknesses in oral speaking that are consistent with the observations of fellow group members.
Justification	Group assessment of a practical experience is an effective means of evaluating both learner progress and the effectiveness of the exercise as a learning experience.
Evaluation Activities	The discussion will serve both to highlight strengths and weaknesses of individual presenters and to evaluate the effectiveness of the preceding exercise.
Resources	Handout 8.1-8.2 (from Lessons One and Two)
Instructional Approach	This lesson serves to summarize and review skills and knowledge gained and practiced during the preceding two lessons. Participants should be asked to comment both on the skills they are developing or need to develop and on the effectiveness of the preceding exercise as a tool for helping them to identify weaknesses in their public speaking ability. Ask participants to discuss their feelings about their public speaking skills and to identify shared weaknesses. Review the major principles for effective speaking. Conclude with a reminder that these skills will be needed in later units.

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT NINE
DEVELOPMENT OF FIRST PRESENTATIONS - Unit Overview

Estimated time for unit - 1 hour 30 minutes

Note: This unit is not subdivided into separate lessons.

Overview

One of the workshop's goals is to provide participants with opportunities to practice making instructional presentations. In this unit participants are able to apply some of their new instructional skills by preparing a short presentation on a selected lesson from Unit Ten materials. These presentations will then be used to teach the content of Unit Ten. Participants will also receive corrective feedback on their presentations.

Entering Competencies

To complete this unit, participants must be familiar with the oral communication skills described in Unit Eight. Participants should have achieved the objectives addressed in the units on Instructional Methods and Lesson Planning.

Objective

Behavior By the conclusion of this unit, workshop participants will have selected, designed and practiced a five- to ten-minute presentation on one of Unit Ten's lessons and be prepared to deliver this presentation. *Conditions* Participants will work from completed IPWs for the selected Unit Ten lessons in preparing their presentations. The instructor will assist with lesson preparations and organize necessary support materials and equipment. All presentations will be delivered as part of Unit Ten's instructional activities. *Acceptable Performance* Presentations, given as part of Unit Ten, will be evaluated on the extent to which they reflect good public speaking techniques.

Evaluation Activities

The Presentation Rating Scale first used in Unit Eight will be used in Unit Ten for evaluating the presentations. The evaluation will be completed by all participants at the conclusion of each presentation. Results will be given to the presenter for corrective feedback purposes.

Resources	Content Outline Equipment and materials as needed or available for Unit Ten -- possibly including an overhead projector, Thermofax or Xerox copier, slide projector, and motion picture projector. (For further explanation, see Unit Ten IPWs.) Copies of Unit Ten IPWs and Content Outlines of lessons selected for delivery.
Instructional Approach	The major activity of this unit consists of the preparation of the presentations of the lessons of Unit Ten by the participants. 1. Begin the session by outlining the objectives and activities of the unit. Assign each lesson or have participants choose them. 2. Copy or remove from your staff guide and distribute the IPWs for each lesson to be prepared and have the participants begin work. 3. Assist as necessary and keep everyone aware of the time so that the workshop remains on schedule.

UNIT NINE
DEVELOPMENT OF FIRST PRESENTATIONS

Content Outline

Estimated time: 90 minutes

Before beginning this unit, review all materials for Unit Ten, "Instructional Media and Related Resources". Decide which of the 15 potential lessons will be presented. In part, this decision should be based on the availability of the necessary equipment. This decision may also be based on the number of participants in your workshop. Use the accompanying Unit Ten Lesson Description List, contained in this outline, to indicate your choices. (Note that some lessons are required and that some are also intended to be given by the instructor rather than as student presentations.

I. Introduction (lecture, 20 minutes)

During the first twenty minutes of class, briefly outline the objective and activities of this unit. Remind participants of how the preceding units have prepared them to give their own presentations. Finally, describe the nature of the Unit Ten lessons you have chosen for them to deliver. Using the Unit Ten Lesson Description List, ask them to choose or assign them to individual lessons. If you have more students than available lessons, have students work in pairs with each preparing half of a lesson.

Use the following outline for planning Unit Ten presentations. A complete list of possible lessons is presented below in the order in which they should occur. Required lessons and lessons to be given by the instructor are so indicated. The remaining lessons should be chosen by/assigned to participants for their presentations depending upon the available time and necessary equipment and materials. A total of five hours has been allotted for Unit Ten presentations. An additional 30 minutes is allowed for use at the instructor's discretion for critiques. See the unit overview and lesson IPWs for further descriptions of these lessons.

UNIT TEN LESSON DESCRIPTION LIST

Lesson	Duration (in minutes*)	Instructional Activity	Characteristics**
1) Introduction	20	Lecture	Required. Given by instructor.
2) Principles of Instructional Graphics	15	Lecture	Required. Participant delivery.
3) Overhead Projector Operation	15	Lecture	Required - unless there is no equipment available. Participant delivery.
4) Overhead Transparencies	15	Lecture	Required. Participant delivery.
5) Graphics Preparation	40	Self-instruction	Optional. Organized by instructor.
6) Slide Projector Operation	15	Lecture	Required if equipment is available. Participant delivery.
7) Using Slides and Filmstrips	20	Lecture	Required. Participant delivery.
8) Using Audio-tapes	15	Lecture	Optional. Participant delivery.
9) Using Motion Pictures	15	Lecture	Required. Participant delivery.
10) Operating Motion Picture Projectors	15	Lecture	Required if equipment is available. Participant delivery.
11) Equipment Operation	35	Self-instruction	Required with available equipment. Organized by instructor.
12) Media Selection	30	Lecture	Required. Participant Delivery.
13) Introduction to IRIS	20	Lecture	Required. Participant Delivery.

Lesson	Duration (in minutes*)	Instructional Activity	Characteristics**
14) Introduction to Instructional Resources Center	15	Lecture	Required. Participant delivery.
15) Community Resources	15	Lecture	Optional. Participant delivery.

* Each participant presentation consists of a five- to ten-minute lecture with five additional minutes allotted for evaluation and feedback. Therefore, you should allow up to 15 minutes for each lesson delivered by participants. Five and one-half hours has been allowed for Unit Ten which includes enough time for all required and optional lessons. However, if all 15 lessons are being delivered, an additional half-hour should be allowed for this unit to cover time overruns.

** There are ten required lessons to be delivered by participants. If there are fewer than ten workshop participants, the instructor should personally deliver the remaining required lessons.

II. Preparation of Presentations (assignment, 70 minutes)

Distribute copies of the IPWs for Unit Ten lessons intended for participant presentation. You will have to copy those you have selected for presentation or remove them from your staff guide. Note that some of the Unit Ten lessons have content outlines already prepared. Distribute copies of these as well for any lessons intended for participant presentation. Also distribute other relevant support materials -- overhead transparencies, etc. Direct participants to prepare presentations from these IPWs that will exemplify good teaching and public speaking techniques as described in Units Six through Eight. Tell them they can prepare and use whatever notes they find helpful for their presentations. Indicate that they should expect to spend 45 minutes preparing their presentations, and 25 minutes practicing them. If possible, provide extra rooms, hallways, etc., for practicing.

Assist participants as they prepare their presentations by making sure they understand the substance and intent of their lessons. (It may help to choose those participants who are most familiar with audio-visual equipment to teach those lessons that deal with that equipment.) If necessary, you may have to offer specific suggestions as to their lesson presentations. (Such help is fine *as the emphasis is on giving them the experience of presenting.) Try to reduce any anxiety about the presentations. Finally, hold to the workshop schedule. Do not let them run over the allotted time in preparing their lessons. After a break, begin with Unit Ten and the lesson presentations.*

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT TEN
INSTRUCTIONAL MEDIA AND RELATED RESOURCES - Unit Overview

Estimated time for unit - 5 hours 30 minutes

Overview

Media have become an integral part of modern instruction. Through EPA's Instructional Resources Information System (IRIS) and Instructional Resources Center (IRC) a variety of visual materials are available relevant to environmental quality control subjects. This unit is designed to provide the basic information and skills needed to select and employ media in support of effective instruction. Among the topics to be covered are the preparation of instructional graphics and overhead transparencies, the operation of simple audio-visual equipment, the location and identification of media resources, and the principles of appropriate media use.

Entering Competencies

None required.

Summary of Objectives

By the conclusion of this unit, participants will be able to:

- produce simple and effective instructional graphics and overhead transparencies
- operate overhead projectors, slide projectors, and at least one form of motion picture projector
- describe the material available from IRIS
- plan and evaluate the appropriate use of instructional media by applying principles of media selection.

This unit also represents the completion of Unit Nine's objective.

Evaluation Activities

Participants will demonstrate mastery of the objectives through appropriate performances on various self-instructional exercises. Quality of participant lesson presentations will be evaluated using the presentation rating scale.

Reference

Kemp, J.E. Planning and producing audio-visual materials. New York: Crowell, 1975.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time***	Resources
1) Introduction	Instructor Lecture-Required	20 min.	Figure 10.1 Handout 10.1
2) Principles of Instructional Graphics	Participant Lecture -Required*	15 min.	Content Outline Figure 10.2-10.6
3) Overhead Projector Operation	Participant Lecture -Required*	15 min.	Figure 10.7 Equipment
4) Overhead Transparencies	Participant Lecture -Required*	15 min.	Content Outline
5) Graphics Preparation	Instructor-Directed Assignment - Optional	40 min.	Materials and Equipment
6) Slide Projector Operation	Participant Lecture -Required*	15 min.	Equipment
7) Using Slides and Filmstrips	Participant Lecture -Required*	20 min.	Content Outline
8) Using Audio Tapes	Participant Lecture-Optional*	15 min.	Content Outline
9) Using Motion Pictures	Participant Lecture-Required*	15 min.	Content Outline
10) Operating Motion Picture Projectors	Participant Lecture -Required**	15 min.	Figure 10.8 Equipment
11) Equipment Operation	Instructor-Directed Assignment -Required**	35 min.	Equipment
12) Selecting Media	Instructor Lecture-Required	30 min.	Content Outline Participant Reference Manual
13) Introduction to IRIS	Participant Lecture -Required*	20 min.	Content Outline Figure 10.9-10.11 Participant Reference Manual
14) Introduction to Instructional Resources Center	Instructor Lecture -Required	15 min.	Content Outline
15) Community Resources	Instructor Lecture-Optional	15 min.	Content Outline Figure 10.12

*Participants are allotted 10 minutes maximum for their presentations. The remaining minutes are for evaluation and feedback.

**Required if equipment is available.

***An additional thirty minutes has been provided during this unit so that the time allowed for critique may be extended as needed.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES

LESSON 1 of 15 INTRODUCTION

Required
Instructor Presentation

Estimated time: 20 minutes

Entering Competencies

None

Objective

By the conclusion of this lesson, participants will be able to describe the informational content of the unit and the purposes for employing it in the workshop. (No measurable performance is required.)

Justification

Since there are two equally potent purposes for Unit 10 - instruction in the use and selection of instructional media and an opportunity to practice speaking in public - orientation to the structure and format of the component lessons is essential.

Evaluation Activities

None are required.

Resources

Figure 10.1 Structure of Unit Ten
Handout 10.1 Presentation Rating Scale (one copy for each participant presentation)

Instructional Approach

This lesson constitutes the introduction and orientation to Unit 10: Instructional Media and Related Resources. You will be accomplishing two purposes during your lecture; a) identifying the informational structure of the unit, and b) describing the dual purposes of the unit.

1. Begin your presentation with a discussion of the importance of learning about various instructional media. Remind participants of the importance of enhancing and complementing verbal instruction with media.
2. Next, describe the lesson structure of the unit. Identify lesson titles within the structure portrayed on Figure 10.1.
3. Finally, discuss the dual purposes of the unit - instruction in the content of the unit and opportunity to practice speaking in public. Remind participants of the time limitations on the presentations. Distribute the rating scale (use Handout

10.1) that participants will use to evaluate each presentation.

4. Conclude with a description of the physical set-up for the two hands-on lessons, Lesson 5 (Graphics Preparation) and Lesson 11 (Equipment Operation).

Structure of Unit Ten

Introduction

Lesson 1	Introduction

Graphics

Lesson 2	Principles of Instructional Graphics
Lesson 5	Graphics Preparation (and part of Lesson Four on transparencies)

Equipment Operation

Lesson 3	Overhead Projector Operation
Lesson 6	Slide Projector Operation
Lesson 10	Operating Motion Picture Projectors
Lesson 11	Equipment Operation

Instructional Use of Media

Lesson 4	Overhead Transparencies
Lesson 7	Using Slides and Filmstrips
Lesson 8	Using Audio Tapes
Lesson 9	Using Motion Pictures

Media Selection

Lesson 12	Selecting Media

Resource Dissemination Systems

Lesson 13	Introduction to IRIS
Lesson 14	Instructional Resources Center
Lesson 15	Community Resources

Figure 10.1/Structure of Unit Ten

Handout 10.1: Presentation Rating Scale

Name of Presenter________________________________Topic____________________

Directions: The following are some important characteristics of good instructional presentations. Check the column on the right that best represents your impression of this presenter's performance on each characteristic. Do not complete the form until the presentation is over. It should only take a few minutes to complete this form. Remember that the purpose of this rating scale is to provide corrective feedback to the presenter.

	Excellent	Very Good	Adequate	Poor	Does not Apply
A. Delivery Techniques					
1. Obtained the attention of the audience at the start	____	____	____	____	____
2. Attempted to match the presentation to the audience's background and preparation	____	____	____	____	____
3. Projected warmth, friendliness, confidence, and interest in the subject	____	____	____	____	____
4. Talked with sufficient volume to reach all listeners.	____	____	____	____	____
5. Varied stress, intonation and pacing as appropriate	____	____	____	____	____
6. Used humor when appropriate	____	____	____	____	____
B. Composure					
7. Maintained relaxed posture during the presentation	____	____	____	____	____
8. Refrained from pacing or shuffling feet	____	____	____	____	____
9. Used no distracting mannerisms	____	____	____	____	____
C. Organization					
10. Began with a clear introduction, including purpose and overview	____	____	____	____	____
11. Provided clear and useful organization for material	____	____	____	____	____
12. Emphasized and/or repeated important points	____	____	____	____	____
13. Incorporated examples and illustrations	____	____	____	____	____
14. Allowed for audience feedback through questions and comments	____	____	____	____	____

Use the back of this form for any additional comments or suggestions you might wish to make.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 2 of 15: PRINCIPLES OF INSTRUCTIONAL GRAPHICS

Estimated time: 15 minutes

Required
Participant Presentation

Entering Competencies — None

Objective

Behavior — By the conclusion of this lesson, participants will be able to explain the six principles for designing instructional graphics.

Conditions — Given a list of the names of the principles,

Acceptable Performance — the participants will describe orally each of the six correctly as judged by the instructor.

Justification — When effectively and properly used, graphics complement and enhance an instructional presentation. However, poorly designed graphics distract attention from the content of the presentation, interfere with learning and cause confusion. Knowledge of some simple principles for designing and using instructional graphics will contribute greatly to the enhancement of learning.

Evaluation Activities — At the conclusion of the presentation, participants will be asked to describe principles of proper graphics design. The oral description will serve as the evaluation activity.

Resources — Content Outline

Figure 10.2	Effective Graphic: Simplicity, Unity, Emphasis
10.3	Effective Graphic: Balance, Appeal, Functionalism
10.4	Functional Graphic
10.5	Ineffective Graphic #1
10.6	Ineffective Graphic #2

Instructional Approach — During this lecture/demonstration, you will be identifying some basic principles for designing and using graphics for instruction. A set of figures is provided to exemplify the principles of graphics design, along with a content outline of the principles. You should use examples to exemplify your presentation; however, you are free to replace the included examples (Figure 10.2 - 10.6) with others of your own choosing.

Begin your presentation by defining or describing an instructional graphic and give examples of types of graphics. Conclude by asking participants to give brief explanations of each principle.

Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 2 of 15: PRINCIPLES OF INSTRUCTIONAL GRAPHICS

Content Outline

Estimated time: 15 minutes

I. Definitions (lecture, 2 minutes)

  A. Graphics

  B. Instructional graphics

II. Visual tools of graphics (demonstration, 4 minutes)

  A. Line - connects elements and directs viewer attention to sequences

  B. Shape - achieves balance and heightens interest; specific shapes can serve as symbols

  C. Space - prevents feeling of overcrowding and highlights

  D. Texture - emphasizes, separates, unites

  E. Color - emphasizes, separates, unites

III. Principles of design (lecture and demonstration, 4 minutes)

Figure 10.2
10.3
  A. SIMPLICITY - the fewer elements into which a given space is divided, the more pleasing it is to the eye.

    1. graphics should be bold and simple

    2. verbal graphics should contain no more than 15-20 words

    3. drawings should contain only key elements

    4. complex visuals should be broken into a series of simpler ones

  B. UNITY - elements of a visual graphic should function together

  C. EMPHASIS - important elements should be highlighted, through use of underlining, arrows, varied sizes and shapes, indentations, and color

  D. BALANCE - the graphic should be organized spatially around a central (focal) point; symmetrical and assymetrical balances should be used to achieve desired effects

E. APPEAL - arrangements of verbal and visual elements should be attractive as well as informative

F. FUNCTIONALISM - graphics must complement or enrich an instructional presentation, not compete with it.

Graphics can be used to:

a) highlight
b) exemplify
c) identify relationships
d) identify sequences
e) isolate
f) summarize

Figure 10.4, 10.5 10.6

Involve class in discussion of these three graphics using the six principles described above.

IV. Discussion of Lesson (guided discussion, 5 minutes)

Critique of this presentation conducted by instructor.

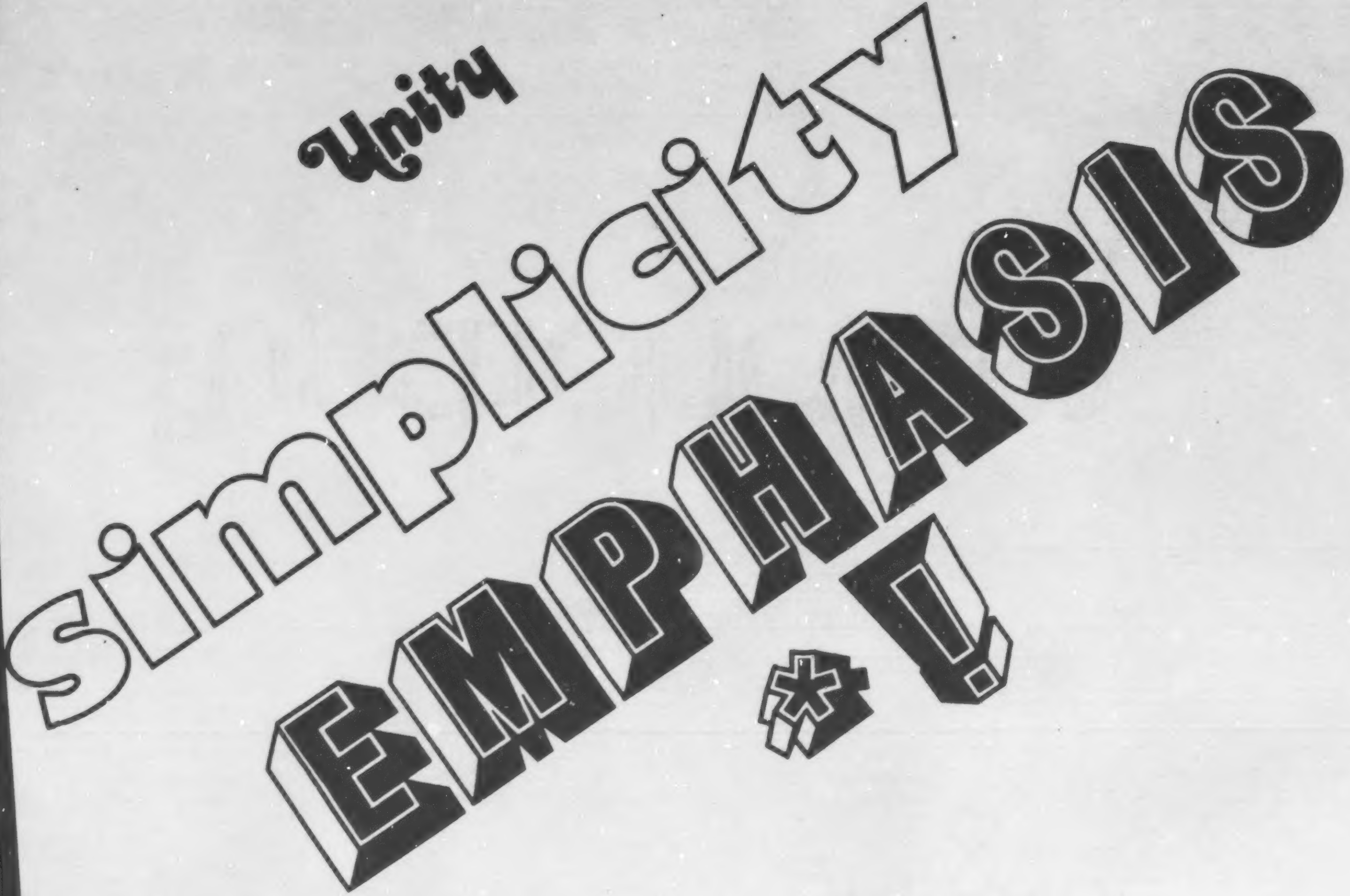

Unity
Simplicity
EMPHASIS
*!

Figure 10.2/ Unity, Simplicity, Emphasis

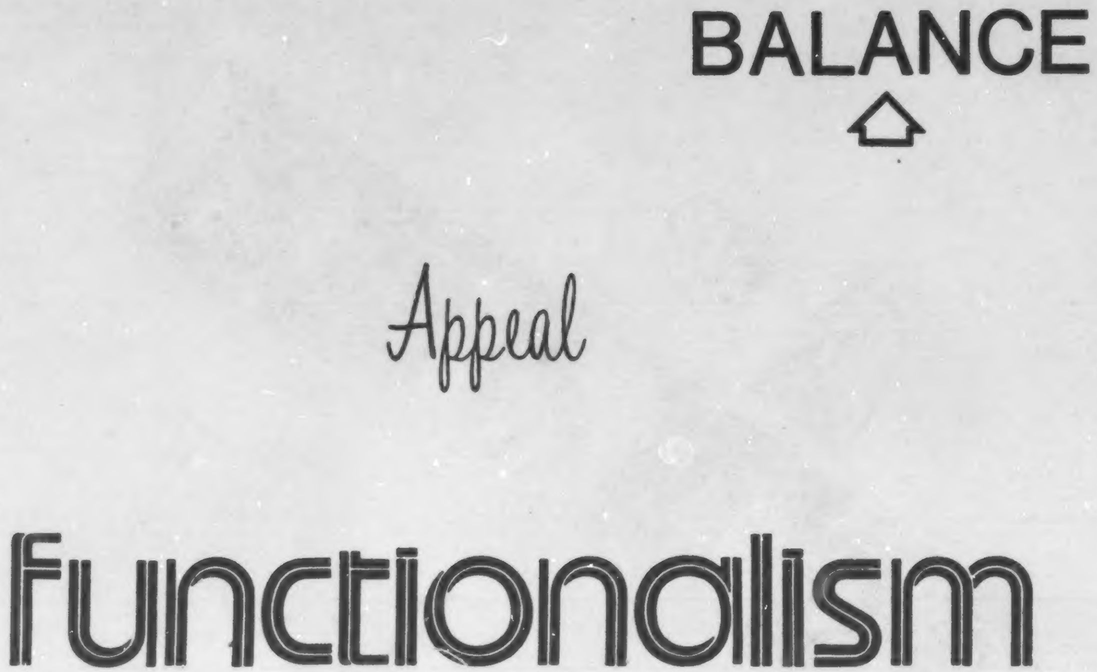

BALANCE
Appeal
Functionalism

Figure 10.3/ Balance, Appeal, Functional

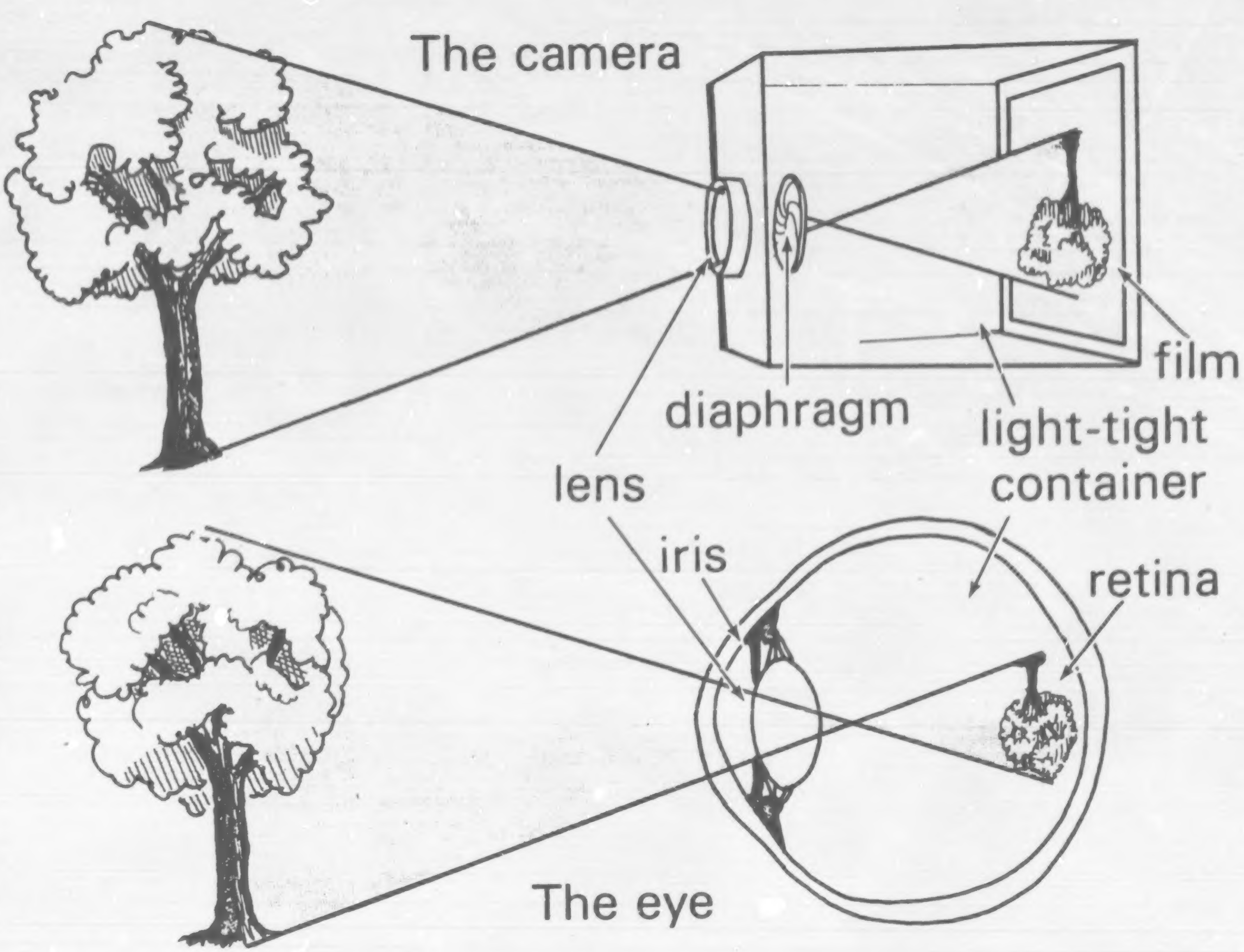

The camera
film
diaphragm
light-tight
container
lens
iris
retina
The eye

Figure 10.4/ Functional Graphic

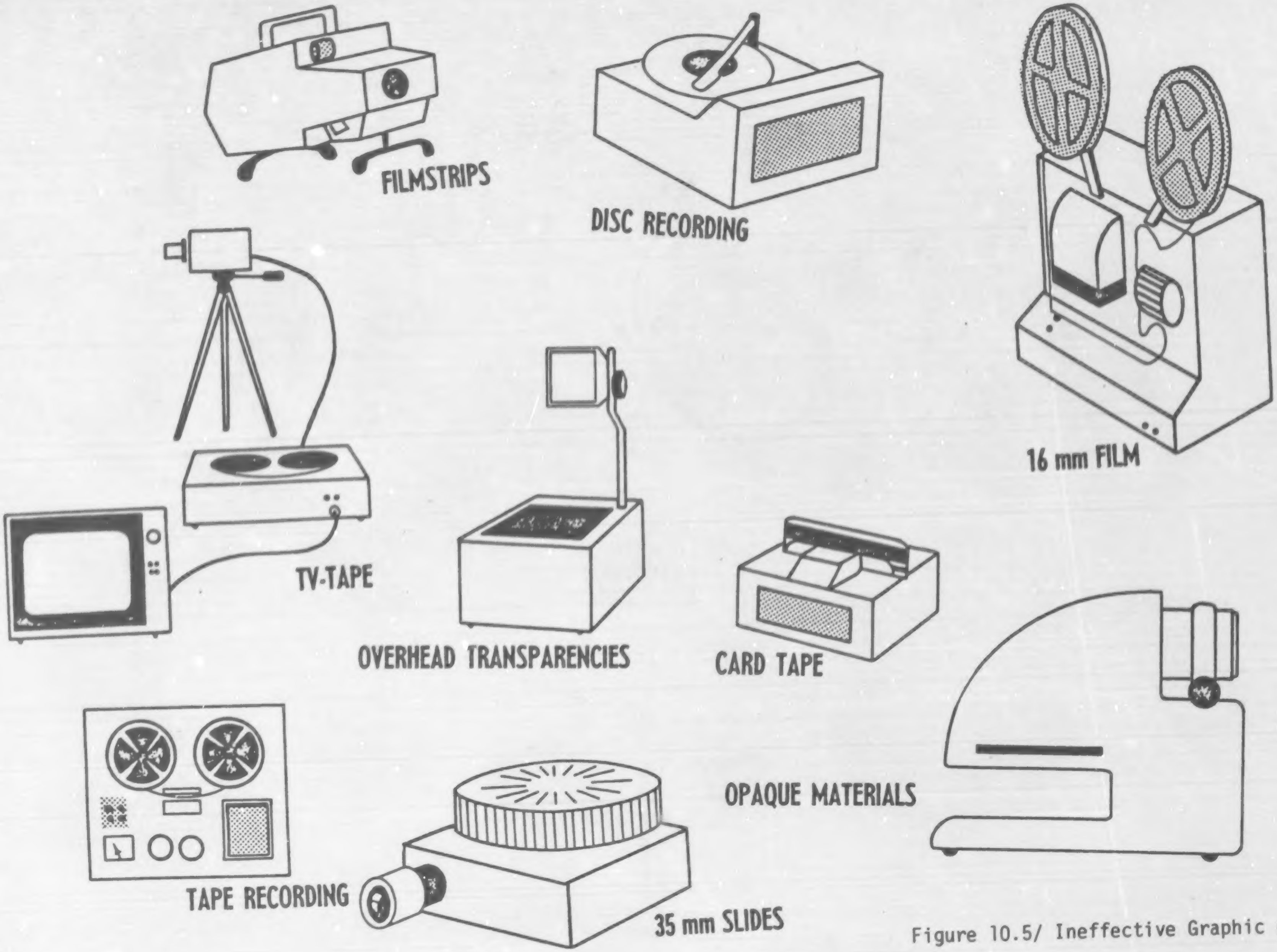

FILMSTRIPS
DISC RECORDING
16 mm FILM
TV-TAPE
OVERHEAD TRANSPARENCIES
CARD TAPE
OPAQUE MATERIALS
TAPE RECORDING
35 mm SLIDES

Figure 10.5/ Ineffective Graphic #1

SIMPLICITY

GRAPHICS SHOULD BE BOLD AND SIMPLE

VERBAL GRAPHICS SHOULD CONTAIN NO MORE THAN 15-20 WORDS

DRAWINGS SHOULD CONTAIN ONLY KEY ELEMENTS

COMPLEX VISUALS SHOULD BE BROKEN INTO A SERIES OF SIMPLER ONES

UNITY

ELEMENTS OF A VISUAL GRAPHIC SHOULD FUNCTION TOGETHER

EMPHASIS

IMPORTANT ELEMENTS SHOULD BE HIGHLIGHTED, THROUGH USE OF XNDERLINING, ARROWS, VARIED SIZES AND SHAPES, INDENTATIONS, AND COLOR

BALANCE

THE GRAPHIC SHOULD BE ORGANIZED SPATIALLY AROUND A CENTRAL (FOCAL) POINT; SYMMETRICAL AND ASSYMETRICAL BALANCES SHOULD BE USED TO ACHIEVE DESIRED EFFECTS

APPEAL

ARRANGEMENTS OF VERBAL AND VISUAL ELEMENTS SHOULD BE ATTRACTIVE AS WELL AS INFORMATIVE

FUNCTIONALISM

GRAPHICS MUST COMPLEMENT OR ENRICH AN INSTRUCTIONAL PRESENTATION, NOT COMPETE WITH IT

Figure 10.6/ Ineffective Graphic #2

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 3 of 15: OVERHEAD PROJECTOR OPERATION

Estimated time: 15 minutes

Required if
Equipment Available
Participant Presentation

Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to set up, operate, and focus an overhead projector. Given an overhead projector and sample transparencies, participants will set up, operate, and focus the projector.
Justification	The most effective and attractive instructional medium is useless if the instructor is unable to operate the equipment which communicates the medium. This lesson is designed to teach participants how to prepare and operate an overhead projector.
Evaluation Activities	Attainment of this objective will be evaluated during Lesson 11, Equipment Operation
Resources	Figure 10.7 Simplified Overhead Projection System Equipment Overhead Projector Sample Transparencies
Instructional Approach	Your presentation is a lecture/demonstration during which you will demonstrate proper operating techniques on the overhead projector. Describe how it should be operated. Then show how to place a transparency on the stage. Next, demonstrate focusing the image. Finally, demonstrate changing the bulb and remind participants to be certain to have a spare bulb. Also remind participants that they will have an opportunity to practice operating the projector during Lesson 11. Allow 5 minutes for discussion of this lesson.

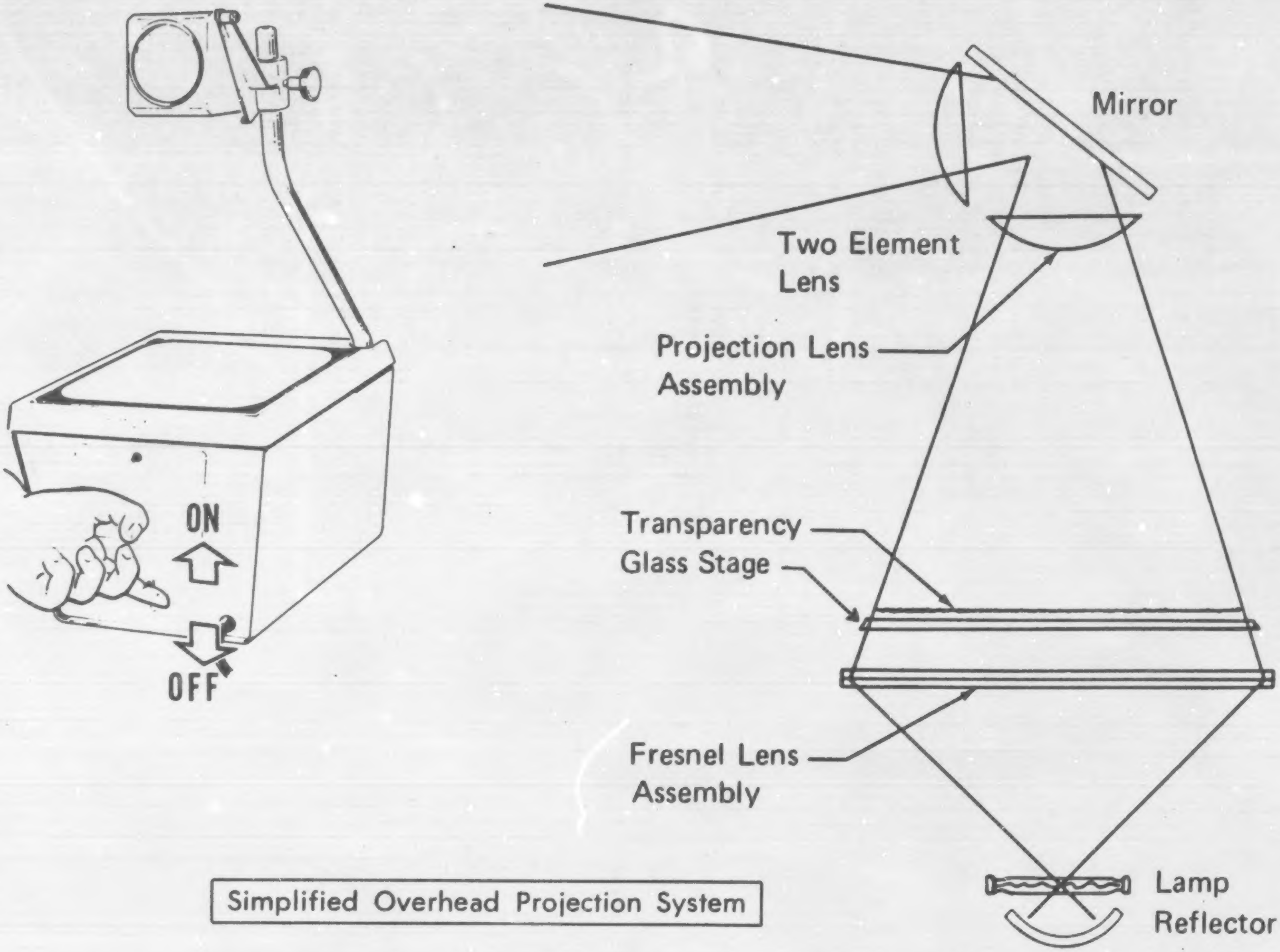

Mirror
Two Element Lens
Projection Lens Assembly
Transparency
Glass Stage
Fresnel Lens Assembly
Lamp
Reflector
ON
OFF
Simplified Overhead Projection System

Figure 10.7/Simplified Overhead Projection System

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 4 of 15 OVERHEAD TRANSPARENCIES

Estimated time: 15 minutes

Required
Participant Presentation

Entering Competencies

None.

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson, participants will be able to list advantages of using overhead transparencies during instruction, and describe two ways of producing transparencies. During the question-and-answer session at the conclusion of the presentation, participants will orally list at least five advantages of using transparencies and both production methods.

Justification

Overhead transparencies are an effective, cost-efficient, and easily produced instructional medium. They can be used for instruction with groups of any size; moreover, they can be easily prepared as needed, modified during instruction, and stored for future use. Therefore, knowledge of the uses and production techniques for overhead transparencies is important for instructors and trainers.

Evaluation Activities

Discussion of the uses and production methods of transparencies during the question-and-answer session will constitute the evaluation activity.

Resources

Content Outline

Instructional Approach

Your presentation is a lecture, during which you will describe the advantages of transparencies over other types of media and describe two ways of preparing transparencies. A content outline is provided in the support materials; use that as a reference for your presentation. Organize the material as you wish. Demonstrate the points you are making through actual use of the overhead projector. However, be sure to cover both topics, advantages and preparation fully. Allow time at the conclusion for questions and discussion in order to evaluate the achievement of this lesson's objective. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 4 of 15: OVERHEAD TRANSPARENCIES

Content Outline - Lecture

Estimated time: 15 minutes

I. Advantages of using overhead projectors and transparencies. (lecture, 5 minutes)

The following is a list of features which are available when you are using an overhead projector and transparencies:

-The room lights remain on so the class or audience may take notes while the visuals are being presented.

-A pointer can be used to direct attention to a particular detail of a diagram. (When the pointer is in the path of the light, a sharp silhouette of the pointer will appear on the screen.)

-A felt-tip pen or grease pencil can be used to make additions to a prepared transparency. (You may do this directly on the transparency or you can save your self the cleaning problem by placing a clear sheet of acetate over the transparency on which you wish to make additions.)

-The instructor faces the class so s/he can see if there are any questions.

-You have ready control over the light source so that if you or one of the students wishes to make a point, you can shut off the light and the attention of the class will shift from the screen to whoever is speaking.

-Possibility of rearranging the parts of a diagram by putting the appropriate information on separate movable sheets. This might be useful in a class on design or layout.

-Capability of choosing the sequence in which certain parts of a transparency are exposed by covering the area with a sheet of cardboard or paper and then removing it when necessary.

-Information can be added to the base transparency by including it on separate sheets of acetate. As each addition is called for, the separate sheets (called overlays) can be placed over the original image.

-Transparencies are a permanent record so the information is always available for recall in the same form in which it was presented initially. Information presented on a blackboard must always be erased to make room for new material.

-Paper copies of the more complex information can be distributed to the audience. This will allow the audience to concentrate on what you are saying because they will not have to copy the transparency.

II. The design of transparencies should follow the principles of instructional graphics described in the previous lesson. Pay particular attention to the following points in the design of transparencies: (lecture, 3 minutes)

- Is the visual simple enough to be understood quickly by the audience?

- If the visual is too complex; could the information have been communicated effectively by using two or more transparencies?

- Would the use of overlays have helped to clarify the message?

- Are the letters and numbers large enough to be read by everyone in the audience?

- Is the format or layout horizontal so that projection of the total graphic is ensured? (Vertical layouts sometimes "run off" the page.)

III. Two methods of preparing transparencies: (lecture, 2 minutes)

A. By Hand

1. Writing on blank acetate film with felt-tip transparency color pens -- useful during a presentation to use overhead projection instead of blackboard; can write and project at the same time.

2. Prepare transparencies ahead of time with transparent tape, dry-transfer letters and numbers, and felt-tip pens -- better artistic quality and more permanent since dry-transfer does not wash off. Mounting of film leads to permanent storage capability.

B. By Thermofax

Copies of large print (3/16" or larger) typed copy illustrations, graphs and diagrams taken from other sources can be heat-transferred by thermofax method; Xerox copies must be used; result is black line-drawing transparency (thermofax does not reproduce color).

Note: Some thermofax equipment can produce black-line drawings on colored acetate.

IV. Discussion of Lesson (Guided discussion, 5 minutes)

Critique of this presentation conducted by instructor.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 5 of 15: GRAPHICS PREPARATION

Estimated time: 40 minutes	Optional Instructor-Directed Assignment
Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to produce an instructional graphic with visual and/or verbal components, using materials provided and either manufactured or photocopied. The graphic will exemplify the six principles discussed in Lesson 2; i.e., simplicity, unity, emphasis, balance, appeal, functionalism.
Justification	Practice in incorporating principles of design is the most effective means of learning to produce useful and attractive graphics.
Evaluation Activities	Participants will prepare instructional graphics which will be evaluated according to obedience to the six design principles.
Resources	Blank white paper for construction and photocopying Blank transparency film Felt-tip markers Dry-transfer letter sheets Photocopying machine Thermofax machine (if available)
Instructional Approach	This lesson is a hands-on practice experience. Participants will design and produce overhead transparencies exemplifying design principles studied in Lesson 2. Have materials available and encourage participants to include a variety of visual and verbal stimuli in their designs. Supervise the activity; collect prepared transparencies and display them around the room. If time permits at the end of the unit, select 3-5 for group evaluation.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 6 of 15: SLIDE PROJECTOR OPERATION

Required
Participant Presentation

Estimated time: 15 minutes

Entering Competencies

None.

Objective

By the conclusion of this lesson, participants will
Behavior be able to set up and operate a slide projector.
Conditions Given the equipment, a set of slides, and a carousel tray, participants will load the tray,
Acceptable Performance place it on the projector, focus the image, and advance the slides.

Justification

The most effective and attractive instructional medium is useless if the instructor is unable to operate the equipment which communicates the medium. This lesson is designed to teach participants how to prepare and operate a slide projector.

Evaluation Activities

Attainment of this objective will be evaluated during Lesson 11, Equipment Operation.

Resources

Equipment

- Slide projector
- Operating Manual for projector
- Carousel tray
- Slide set

Instructional Approach

Your presentation is a lecture/demonstration during which you will demonstrate proper operating techniques on the slide projector. Begin by identifying the parts of the projector. Describe how it should be operated. Then show how to load slides in the carousel tray; discuss thumbspotting as a technique for ensuring proper loading. Next, demonstrate focusing the image, advancing slides forward and backward, and using the remote advancer. Demonstrate changing the bulb and remind participants to be certain to keep a spare bulb available. Finally, inform participants that some projectors have a mode for automatic slide advancement. With such projectors, care must be taken to ensure that the switch controlling automatic advancement is in the desired position before the projector is turned on. Remind participants that they will have an opportunity to practice operating the projector during Lesson 11. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 7 of 15: USING SLIDES AND FILMSTRIPS

Estimated time: 20 minutes

Required
Participant Presentation

Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to describe the characteristics and uses of slide presentations and filmstrips and identify instructional purposes for which each would be appropriate. Given an instructional situation, participants will apply use criteria to select either the slide show or the filmstrip as most appropriate.
Justification	Slide presentations and filmstrips share many advantages as instructional media. However, there are sufficient differences between them to encourage the application of specific selection and use criteria to achieve specific instructional purposes. This lesson is designed to help participants identify essential differences between the two and use those differences to select the appropriate medium for a given instructional purpose.
Evaluation Activity	Participant discussion during the conclusion of the presentation will serve as the evaluation activity.
Resources	Content Outline
Instructional Approach	Your presentation is a lecture during which you will identify the characteristics of slides and filmstrips as instructional media and use the differences to select an appropriate medium in a given instructional situation. A content outline is provided to guide the design of your presentation. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 7 of 15: USING SLIDES AND FILMSTRIPS

Content Outline

Estimated time: 20 minutes

I. Definitions (lecture, 2 minutes)

Begin by defining a filmstrip as a series of still pictures and strip of film (usually 35mm but can be 16mm or 8mm) often accompanied by a sound program. Explain that any sound track is a separate component of the system and is not on the film. The accompanying sound can be in the form of records, audio cassettes, or conventional ¼-inch audio tape.

II. Filmstrips (guided discussion, 5 minutes)

Mention that filmstrips are not used very often; however, there are a number of advantages to using them. Make sure that the following advantages are covered:

a. show planned sequence of ideas
b. encourage discussion
c. permit pacing of material
d. can be used effectively with other material
e. are available on a variety of subjects
f. are inexpensive and easily stored

After discussing the advantages, point out that the main disadvantage of filmstrips is that they are inflexible. That is, they must be shown in the same sequence without additions or deletions. Since technical topics often require updating of visuals, this is a significant disadvantage.

III. Slides (Guided discussion, 5 minutes)

Introduce the discussion on slides by explaining that they, unlike filmstrips, can be used in or out of sequence. Ensure that the following advantages are identified:

a. permit local production
b. can be made to meet special needs
c. can be arranged in any order desired
d. are easily revised and updated
e. can be combined effectively with taped narrative
f. are inexpensively produced

Slide pictures come in various size mounts according to the film size used in the camera. The sizes to be mentioned are 127 and 120, 2" x 2", 35mm, 2½" x 2½", and 3¼" x 4". It would be well to *point out that 35mm transparencies mounted in 2" x 2" slides are the most easily produced, the easiest to use, and the most popular.*

IV. Conclusion (guided discussion, 3 minutes)

Conclude by asking participants to use the above information to select the medium most appropriate for teaching this lesson on using slides and filmstrips during this workshop. Ask them to justify their selection.

V. Discussion of Lesson (guided discussion, 5 minutes)

Critiques of this presentation conducted by instructor.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 8 of 15: USING AUDIOTAPES

Estimated time: 15 minutes

Optional
Participant Presentation

Entering Competencies	None.
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to identify appropriate uses of audiotapes and discuss ways of increasing their effectiveness as an instructional medium in their own words. Participants will name situations for which audiotapes are an appropriate instructional medium and list conditions under which they are most effectively employed.
Justification	The advent of the compact cassette recorder has made the use of sound recordings a popular instructional activity because of the ease and convenience of using audiotapes. This lesson introduces appropriate uses for audiotapes and some techniques for improving their instructional effectiveness.
Evaluation Activities	Participant discussion of the uses of audiotape instruction constitutes the evaluation activity.
Resources	Content Outline
Instructional Approach	Your presentation is a lecture during which you will discuss the advantages of audiotapes as an instructional medium and identify some ways of increasing their effectiveness. You may wish to read the section on audiotapes before you begin (see Reading for Lesson 12). Begin by listing kinds of audio media - records, cassette tapes, and tape recordings. Describe the advantages of audiotapes, and conclude by discussing ways of increasing the effectiveness of their use. A content outline has been provided to guide your presentation. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 8 of 15: USING AUDIOTAPES

Content Outline

Estimated time: 15 minutes

I. Audio Media (lecture, 1 minute)

- -Records
- -Cassette Tapes
- -Reel-to-Reel

II. Advantages of Audio Tapes (guided discussion, 5 minutes)

- -they are well-suited for individualized instruction
- -the material cannot be erased
- -special passages can easily be selected
- -the equipment is readily available
- -pace can be varied for each student
- -tapes are easily made
- -they are available for immediate playback
- -the material can be edited for special use
- -libraries are available for the loaning of tapes
- -pre-recorded tapes can be easily scheduled
- -they can be evaluated by either a teacher or a student
- -they can be synchronized with other material

III. Increasing the Instructional Effectiveness of Audio Tapes (lecture, 4 minutes)

- -provide visuals to highlight important points
- -provide a study guide to facilitate self-instruction

  a. identify objectives
  b. provide self-check exercises
  c. provide directions for use

- -keep listening activities brief (usually no more than 30 minutes)
- -record from a prepared script to ensure good organization and continuity
- -package the materials in an attractive and accessible format

IV. Discussion of Lesson (guided discussion, 5 minutes)

Critique of this presentation conducted by instructor.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 9 of 15: USING MOTION PICTURES

Required
Participant Presentation

Estimated time: 15 minutes

Entering Competencies

None.

Objective

By the conclusion of this lesson, participants
Behavior will be able to state advantages of and concerns
Conditions about using motion pictures as an instructional
tool. Using their own words, participants will
Acceptable Performance list at least three advantages of motion pictures
and identify all important concerns about their
use.

Justification

Motion pictures are an extremely attractive instructional medium. Attractiveness alone is not a reasonable criterion for selecting the medium for use in instruction. This lesson identifies some appropriate uses for and concerns about utilizing motion pictures in instruction.

Evaluation Activities

Discussion of the issues of the lesson constitutes the evaluation activity.

Resources

Content Outline

Instructional Approach

Your presentation is a lecture during which you will discuss the advantages of motion pictures for instruction and some concerns about its use. First list and discuss the advantages of using motion pictures; then list and discuss the concerns about their use.

Conclude by reminding participants that different types of motion pictures can be used for different size groups; i.e., 16mm for large groups, 8mm for small groups or individuals. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 9 of 15: USING MOTION PICTURES

Content Outline

Estimated time: 15 minutes

I. Advantages of Motion Pictures (lecture, 5 minutes)

- a. present images involving motion - important when skill or concept being taught includes movement
- b. show events of past and present
- c. add realism to the learning situation
- d. show unique processes and objects through special photographs
- e. influence changes in attitude
- f. provide aesthetic experiences

II. Concerns (lecture, 5 minutes)

- a. they must not be considered entertainment
- b. there must be a clear objective for their use to achieve
- c. they should blend into the overall program
- d. their presentation should be appropriate to the situation
- e. facilities must be available for proper viewing

III. Discussion of Lesson (guided discussion, 5 minutes)

Critique of this presentation conducted by instructor.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 10 of 15: OPERATING MOTION PICTURE PROJECTORS

Required if Equipment Available
Participant Presentation

Estimated time: 15 minutes

Entering Competencies

None

Objective

Behavior
Conditions
Acceptable Performance

By the conclusion of this lesson, participants will know how to set up and operate a 16mm motion picture projector. Given a reel of film and projector equipment, participants will be able to load the film, "frame" the picture (if appropriate), focus the image, and show the film.

Justification

The most effective and attractive instructional medium is useless if the instructor is unable to operate the equipment which communicates the medium. This lesson is designed to teach participants how to operate a motion picture projector.

Evaluation Activities

Attainment of this objective will be evaluated during Lesson 11, Equipment Operation.

Resources

Figure 10.8 (to be prepared by participant - a diagram displaying the loading sequence for the particular type of projector available on site)

Equipment
- 16mm motion picture projector
- film
- operating manual for projector

Instructional Approach

Your presentation is a lecture/demonstration during which you will demonstrate proper operating techniques on the 16mm motion picture projector. Begin by identifying the parts of the projector; prepare and use a diagram to display the parts of the available projector. Then demonstrate how to load the film; again using the diagram.

Next, discuss important concerns in operating the equipment and list the steps in loading, focusing and operating the projector. Demonstrate changing the bulb and remind participants to be certain a spare bulb is available. Finally, remind participants that they will have an opportunity to practice operating the projector during Lesson 11. Allow 5 minutes for discussion of this lesson.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 11 of 15: EQUIPMENT OPERATION

Required if Equipment Available
Instructor Directed Assignment

Estimated time: 30 minutes

Entering Competencies	None
Objective *Behavior* *Conditions* *Acceptable Performance*	By the conclusion of this lesson, participants will be able to operate an overhead projector, slide projector, and 16mm motion picture projector. Given the equipment, they will load the software, turn on the projector, focus it, and operate it.
Justification	The most effective and attractive instructional medium is useless if the instructor is unable to operate the equipment. This lesson allows participants to practice operating projection equipment.
Evaluation Activities	Participants will be evaluated as they operate the projection equipment.
Resources	Equipment Slide projector, slide set, and carousel tray Motion picture projector and film Overhead projector and transparencies Screens Operating manuals for each piece of equipment
Instructional Approach	The activity for this lesson is a practice session during which participants load and operate projectors. Have ready at least one station for each type of projector with all hard- and software available. Participant-instructors who delivered Lessons 3, 6 and 10 should stand by each piece of equipment to supervise their proper operation.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES-
LESSON 12 of 15: SELECTING MEDIA

Estimated time: 30 minutes

Required
Instructor Presentation

Entering Competencies	None
Objective *Behavior*	By the conclusion of this lesson, participants will be able to: identify important criteria for selecting media and describe the advantages and limitations of each medium using the criteria.
Conditions *Acceptable Performance*	Given a set of selection criteria, participants will identify those criteria important to the selection process and use those criteria to describe media.
Justification	Selecting media for instruction is not a very scientific process. There is little evidence to indicate that one media is significantly superior to another in any given instructional situation. There are, however, some factors which would indicate that it may be more desirable or practical to use a particular media in a given situation. These factors are the characteristics of a particular media, equipment requirements for using or producing materials, the cost of production of materials and the desirability of presenting the instruction in a group or individual setting. This lesson provides information on the characteristics of various media as they relate to these factors.
Evaluation Activity	Participant discussion of selection criteria will serve as the evaluation activity.
Resources	Content Outline Participant Reference Manual Assignment 10.1 Selecting Media for Instruction
Instructional Approach	The instructional activity for this lesson is a lecture, during which you will identify criteria for selecting instructional media and apply those criteria to analyze the advantages and limitations of several types of media. The lecture should follow the content outline. A reading in the Participant Reference Manual summarizes the content of the lecture; refer to that reading when preparing

your lecture. Remember that the purpose of this presentation is a general consideration of some basic selection criteria.

1. Begin with a discussion of the selection criteria. Describe each briefly and explain the reason for including it.
2. Apply the criteria to the individual media, discussion one medium completely before considering the next.
3. Apply the criteria in a selection example. Use your teaching situation within the basic workshop as the basis for the example.
4. Refer participants to the reading in the Participant Reference Manual for fuller explanations.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 12 of 15: SELECTING MEDIA

Content Outline

Estimated time: 30 minutes

I. Selection Criteria (lecture, 15 minutes)

- A. Cost: Time, Money
  - 1. Production costs
  - 2. Utilization costs
- B. Ease of Use
  - 1. Ease of use of production equipment and materials
  - 2. Ease of use in instruction
  - 3. Storage and maintenance concerns
- C. Flexibility
  - 1. Flexibility in sequencing and revising materials
  - 2. Flexibility in pacing of materials
  - 3. Flexibility in use with audiences of different sizes
  - 4. Combinability with other media

II. Selection Criteria Applied to Various Media (lecture, 15 minutes)

- A. Photographic Series
- B. Slide Series
- C. Filmstrips
- D. Recordings
- E. Overhead Transparencies
- F. Motion Pictures
- G. Television

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 13 of 15: INTRODUCTION TO IRIS

Estimated time: 20 minutes

Required
Participant Presentation

Entering Competencies

None

Objective

Behavior
Conditions
Acceptable Performance

By the end of this lesson, participants will be able to explain the nature and purpose of the Instructional Resources Information System (IRIS), describe the type of information published in resumes about instructional resources in IRIS, and describe how to use IRIS to locate resources by orally responding to the presenter's questions. Answers must be correct as judged by presenter.

Justification

The Instructional Resources Information System (IRIS) contains a growing volume of information about instructional materials of potential use to participants in their work. Participants should learn how to use IRIS in order to make use of this valuable resource.

Evaluation Activities

Oral responses to the presenter's questions will serve as the evaluation activity for this lesson.

Resources

Content Outline
Figure 10.9 IRIS
10.10 IRIS Abstract Format
Participant Reference Manual

Instructional Approach

This lesson consists of a lecture introducing participants to the IRIS data base. A content outline is provided to guide the lecture; figures are keyed in the content outline.

1. Introduce IRIS and describe its usefulness as a resource bank for instructional materials related to wastewater treatment and water quality education. Use Figure 10.9.
2. Explain how to use the IRIS Compilation to get information about the resources in the collection. Include a discussion of the items in the IRIS resumes and of the indexes

which facilitate locating items of interest to the user. Use Figure 10.10 and also the Sample Abstracts in the Participant Reference Manual.

3. Inform the participants about the location of information on obtaining copies of resources listed in IRIS.

4. Briefly note the access databases for computer searches of the IRIS Compilation.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 13 of 15: INTRODUCTION TO IRIS

Content Outline

Estimated time: 20 minutes

I. Instructional Resources Information System (IRIS) (lecture, 2 minutes)

A. Nature of IRIS

Figure 10.9

IRIS is a computer-based information system managed by U.S. EPA Information Dissemination Project which acquires, reviews, indexes, and announces both print and non-print instructional materials.

IRIS currently lists information about 3000 printed or audio/visual instructional resources which are available from various individuals, state and federal government agencies, educational institutions and commercial companies throughout the country. Materials selected for IRIS must be available.

B. Purpose of IRIS

The purpose of IRIS is to provide a central source of information about available instructional materials related to wastewater treatment, water quality and pesticide education and instruction.

C. Locating Materials in IRIS

The user can locate information about the resources contained in IRIS by manually searching the collection or by a computer search of a tape of the collection. Following are the details of both kinds of searches.

II. Locating Materials in IRIS by Manual Search (lecture, 6 minutes)

A. Source of Information

A "Compilation of Abstracts to Water Quality and Water Resources Materials" is available in either paper copy or microfiche from the U.S. EPA Information Dissemination Project, Ohio State University, 1200 Chambers Road, Columbus, Ohio 43212.

B. IRIS Resumes

The IRIS Compilation has resumes of information about every resource in the collection. As applicable, the following items of information are provided in the resume for each resource:

Have the participants open their manuals to the Unit 10, Lesson 13, IRIS Sample Abstract entitled, "Entry in IRIS Only." Use this to exemplify each of the following items of information provided in an IRIS resume.

Figure 10.10

1. Accession Number - the identification number. All identification numbers for items in IRIS begin with the letters, EW.

2. Publication Date

3. Title

4. Author(s) - (not applicable in the "Sample")

5. Institution Where Prepared - A sponsoring agency may be cited.

6. Availability - where the material can be obtained

7. Descriptors - subject terms which characterize the contents and form of the materials. Major descriptors are preceded by an asterisk.

8. Descriptive Notes - various items of information like the number of pages in a printed resource, the kind of binding, the price as quoted at the time the item was entered into the IRIS Collection, etc..

9. Abstract - a brief description of the contents of the resource.

10. ERIC Information

    Some of the resources in the IRIS collection are also entered in the Educational Resources Information Center (ERIC) collection. (ERIC is another, more extensive national information system designed and developed by the National Institute of Education).

    Have participants turn to the other IRIS Sample Abstract in their manuals. This one is entitled, "Entry in IRIS and ERIC." Use this to exemplify the following.

    a. Items entered in both systems have an IRIS (EW) and also an ERIC (ED) identification number.

    b. For items in the ERIC system, the resume includes a note, "ISSUE", which tells where to find the ERIC write-up of the item. In the sample, the reference is to an ERIC publication, RIE, "Resources in Education."

C. Locating Resumes of Interest

1. Manual Scan - A person can scan through the resumes in the IRIS Compilation to locate resources which meet particular instructional needs.

2. Subject Index - The Compilation also contains a list of the subjects (descriptors) of the resources and the IRIS identification number for the related resource. Then the resume can be easily located to provide details about the resource.

3. Author Index

   A user may know the author of a resource(s). An author index to IRIS identification numbers is in the Compilation.

4. Institution Index

   The Compilation also contains an institution (agency) index to IRIS identification numbers.

5. Title Index

   This index is not in the Compilation. It is a separate document which contains all the titles entered in the Compilation. This index is available from the source given for the Compilation. (II A above).

III. Obtaining Copies of Resources (lecture, 2 minutes)

The resume for the resource contains information about the source and cost of the resource.

A. Printed Materials

These are available in two forms:

1. Hard Copy - Paper the size of the original publication.

2. Microfiche - 4" x 6" sheets of microfilm on which up to 96 pages of text are reproduced. The microfilm can be enlarged and copied page for page on reader-copier equipment.

B. Audiovisual Materials

1. As applicable, the source for purchase of audiovisuals is given as part of the resume.

2. A number of these are available on free loan from EPA's National Training and Operational Technology Center, Cincinnati, Ohio 45268.

IV. Locating Materials in IRIS by Computer Search (lecture, 2 minutes)

A. Access Database for IRIS

Bibliographic Retrieval Services, Inc., (BRS) is the database vendor serving as the access to the computer tapes of the IRIS Collection. For a modest fee, you can arrange to have a computer search IRIS according to your needs.

B. Access Databases for ERIC

Many IRIS resources are also entered in the ERIC System which includes a computer tape of that collection. BRS, Systems Development Corporation and Lockheed are current vendors of computer searches of the ERIC tapes.

C. Information About Locations of Access Databases

Contact the EPA Information Dissemination Project (II A above) for information.

D. Obtaining Copies of Resources

After choosing resources from the resumes provided by a computer search, the procedure for obtaining copies is the same as in manual searches (III above).

V. Conclusion (oral quiz, 3 minutes)

Conclude by asking participants questions which require oral explanations about the nature and purpose of IRIS, the type of information found in IRIS resumes and the procedures one can use to search the IRIS Compilation.

VI. Discussion of Lesson (guided discussion, 5 minutes)

Critiques of this presentation conducted by instructor.

IRIS

Instructional Resources Information System

Figure 10.9/IRIS

IRIS Abstract Contains the Following Information:

Accession Number

Publication Date

Title

Author(s)

Institution Where Prepared

Descriptors

Price of Copy

Descriptive Notes

ERIC Compilation

Abstract

Figure 10.10/IRIS Abstract Contents

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 14 of 15: INTRODUCTION TO INSTRUCTIONAL RESOURCES CENTER

Estimated time: 15 minutes — Required Instructor Presentation

Entering Competencies

By the conclusion of this lesson, participants will be able to describe the nature, purpose, and
Behavior components of EPA's Instructional Resources Center
Conditions (IRC). In oral responses to questions, participants will explain why and how the IRC was formed and
Acceptable Performance list the major components and services of the IRC.

Justification

The IRC represents a systematic mechanism for obtaining both EPA-developed courses and programs and materials produced by other sources. Awareness of and ability to use the centralized system will assist instructors in selecting relevant instructional materials for use during training.

Evaluation Activities

Oral responses to questions at the conclusion of the presentation will serve as the evaluation activity.

Resources

Content Outline

Instructional Approach

This lesson is designed to provide participants with an overview of the nature, purpose, and components of the IRC. An article published in EPA's IRC Bulletin has been provided as source material for your presentation.

1. Describe the IRC and its origins.
2. Explain the purpose of the IRC.
3. List and briefly explain each of the following components
    a) IRC Viewing Facilities (see paragraph 5 of Article)
    b) IRC Lending Library
    c) IRC Bulletin
4. Call on participants to explain the nature, purpose, and components of the IRC.
5. Encourage participants to write to EPA and get on the mailing list to receive the IRC Bulletin. It will keep them informed about available instructional resources. The address is:

IRC Bulletin
U.S. EPA - NTOTC
Cincinnati, Ohio 45268

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 14 of 15: INTRODUCTION TO INSTRUCTIONAL RESOURCES CENTER

CONTENT OUTLINE

Estimated time: 15 minutes

Using the following article, prepare a lecture on the function and uses of EPA's Instructional Resources Center.

June 1978

EPA IRC BULLETIN

Instructional Resources Center Assists Training Programs

One of the results of the current national concern about pollution control has been the development of numerous publications and instruction programs designed to assist education and training personnel. Published documents by federal agencies, state agencies, educational institutions, and public interest groups address pollution control issues from a variety of perspectives. A review of the instructional materials available indicates that some duplication exists, and more significantly, there is a limited awareness of available resources by educators and trainers. To assist with coordination and dissemination of educational information, the EPA's National Training and Operational Technology Center (NTOTC) recently formed the Instructional Resources Center (IRC).

It is anticipated that the Instructional Resources Center will provide pollution control instructors in State training organizations and educational institutions with a systematic mechanism to obtain EPA-developed courses and programs as well as materials produced by other sources. EPA realizes that pollution control goals cannot be adequately achieved without the cooperation and assistance of educational institutions. Therefore, a central location that makes information and materials available to the wide and diverse educational constituency is imperative.

A major purpose of the IRC is to avoid unnecessary duplication of effort so that available resources can be more effectively and efficiently used. All IRC goals are intended to facilitate pollution control instruction by either incorporating quality materials into existing curricula or introducing new courses of study.

The IRC is comprised of a variety of interconnected components. A qualified IRC staff is available to assist educational institutions with their program needs including the consideration of alternatives for pollution control course content and teaching methodologies.

IRC Viewing Facilities

The IRC is located in a modern building that also houses the EPA Environmental Research Center — the largest water pollution control research program in the world. Within the facility are a variety of educational support services including a television studio and a graphics arts department. Sample copies of printed water quality and pesticides education/training materials are maintained and available for review. A separate area has been designed for reviewing audio visual materials, and includes individual study carrels for viewing television cassettes, slide/tape presentations, filmstrips and movies. A variety of equipment enables users to try various media and materials prior to allocating funds for purchases. The facilities are open daily from 8:00 a.m. - 4:00 p.m.

Staff members of the National Training and Operational Technology Center include chemists, microbiologists, ecologists, engineers, educators, and a variety of other professionals and technicians who can assist with general and specific education/training problems. Since the NTOTC staff is responsible for the instructional materials development and the educational delivery component of the water quality programs, they are familiar with Agency regulations and educational objectives.

IRC Lending Library

Another service of the IRC is the IRC Lending Library. The purpose of this component is to lend audiovisual instructional units to education and training organizations to support classroom activities. Forty-four 35 mm slide/tape units, 79 video cassette units and 55 films are available for free, short-term loan to those who train personnel engaged in programs related to the detection, causes, prevention and control of environmental pollution. Most of the units were developed to be used in EPA-conducted courses and are not designed to be self-instructional. Rather, they are training tools to be used in an integrated presentation of a topic. Topics range from statistical analysis of pollution data to chemical and biological laboratory procedures.

A catalog of audiovisual support units can be obtained by writing to the Instructional Resources Center Office. Questions can be addressed to *Mrs. Eileen Hopewell* at NTOTC, (513) 684-7501.

Communications

The Instructional Resources Center serves as a major communication link with educational and training organizations. It is expected that the needs of the educational community will be conveyed through the established lines open to all who wish to participate. One of the methods used to maintain dialogue will be the *IRC Bulletin*. Another major effort will be the attendance of EPA personnel at national conferences and meetings where they will address current programs and educational strategies. Requests for NTOTC personnel to make presentations should be addressed to the Director, NTOTC.

The Instructional Resources Center is a comprehensive center to provide assistance to those involved in pollution control training and education. Those interested in using the IRC are encouraged to call, write, or visit the facility:

U. S. Environmental Protection Agency
National Training and Operational Technology Center
Instructional Resources Center
Cincinnati, OH 45268

Eileen Hopewell, Coordinator of IRC Lending Library, processes requests for training materials.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 15 of 15: COMMUNITY RESOURCES

Optional
Instructor Presentation

Estimated time: 15 minutes

Entering Competencies

None

Objective

Behavior By the end of this lesson, participants will be able to list resources in their communities which may be useful in providing instructional materials that are relevant for training situations. *Conditions* Orally and without using any notes, participants will list at least four community resources that may be able *Acceptable Performance* to provide instructional materials relevant to their training situations.

Justification

In order to make the widest possible use of instructional resources, participants must be aware of the various community sources of materials and expertise.

Evaluation Activities

Oral responses to the presenter's questions will serve as the evaluation activity for this lesson.

Resources

Content Outline
Figure 10.12 Community Resources

Instructional Approach

This lesson is designed to make participants aware of sources of relevant instructional materials and professional expertise within their own communities. A content outline is provided; the accompanying figure is keyed in the test.

1. Introduce the notion of community resources. Explain that there are many sources of materials and expertise available within local communities.
2. List and briefly explain each of the major community resources. Use Figure 10.12.
3. Ask participants to suggest additional resources.

UNIT TEN: INSTRUCTIONAL MEDIA AND RELATED RESOURCES
LESSON 15 of 15: COMMUNITY RESOURCES

Content Outline

Estimated time: 15 minutes

I. Community Resources Defined (lecture, 5 minutes)

   A. Sources of Materials, Information, and/or Expertise Available Within a Community

   B. Levels of Resources

      1. State

      2. County

      3. Local (city, village, or town)

II. Types of Resources (lecture, 10 minutes)

Figure 10.12 A. Water Plants

   B. Educational Institutions

      1. Colleges and Universities

      2. Vocational/Technical Schools

   C. Libraries

      1. Public and Private

      2. Individual Library Collections and Inter-Library Loans

   D. Trainees with Special Expertise

   E. Area Environmental Training Centers

   F. Special Interest Groups (i.e., Sierra Club)

COMMUNITY RESOURCES

- Water Plants
- Educational Institutions
- Libraries
- Trainees With Special Expertise
- Area Environmental Training Centers
- Special Interest Groups

Figure 10.12/Community Resources

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT ELEVEN
CLASSROOM MANAGEMENT - Unit Overview

Estimated time for unit - One hour

Overview	No matter how well-planned and prepared the instruction is, failure to consider and control certain variables in the classroom environment can severely lessen the effectiveness of that instruction. This unit introduces variables in the physical and interpersonal environment that the instructor should consider in planning a class. Techniques for managing the class and maintaining attention are also described.
Entering Competencies	To begin this unit participants should have made a presentation before a group and be able to select media and methods of instruction.
Summary of Objectives	Through the activities of this unit, participants will be able to: -identify important variables in the physical and interpersonal environment of the classroom and predict their impact on instructional effectiveness -describe and give examples of basic techniques for classroom management and maintaining attention.
Evaluation Activities	Instructor will insure that participants have accomplished the unit's objectives through their participation in the class.
References	None.

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
Classroom Management	Lecture; Guided Discussion	60 min.	Content Outline Figure 11.1-11.5 Handout 11.1

UNIT ELEVEN: CLASSROOM MANAGEMENT
LESSON 1 of 1: CLASSROOM MANAGEMENT

Estimated time: 60 minutes

Entering Competencies

None.

Objectives

Behavior · *Conditions* · *Acceptable Performance*

The activities of this lesson will enable participants to identify important variables in the physical and interpersonal environment of the classroom and predict their impact upon instructional effectiveness. In a guided discussion, participants will draw upon their personal experiences to demonstrate their understanding of the variables by identifying and describing the impact of at least one variable.

Behavior · *Conditions* · *Acceptable Performance*

Participants will also be able to describe and give examples of basic techniques for managing the class and maintaining attention. In general discussion, each participant will describe and provide an example of at least one technique.

Justification

A variety of physical and psychological variables can have a serious impact upon the effectiveness of instructional presentations. This lesson reviews those variables which can be controlled through careful management of instructional activities in the classroom.

Evaluation Activities

Instructor will insure that participants have accomplished the unit's objectives through their participation in class.

Resources

Content Outline

Figure 11.1	Environmental Influence
11.2	Physical Environment
11.3	Psychological Environment
11.4	Planning Considerations
11.5	Managing Techniques
Handout 11.1	Techniques for Overcoming Problems with the Physical or Psychological Environment

Instructional Approach

This lesson begins with a brief introductory lecture on the impact the environment can have on instruction. This is followed by a guided discussion of the physical and psychological factors which may impede learning. Finally, a discussion and summary lecture on techniques for controlling these factors and minimizing their effects should be planned. A handout has been designed to accompany this lesson, but it should not be given out until the end to insure meaningful and creative discussion sessions.

1. Introduce the topic of environmental influences on learning and instruction.

2. Conduct a discussion on the physical and psychological environment of the classroom. Have each participant suggest a specific characteristic and describe its potential impact upon instructional effectiveness. (See content outline.) List the points as they are generated.

3. In a similar manner, ask participants to suggest techniques for managing the class and maintaining attention that will control environmental factors or limit their effects. Call upon individual participants to suggest techniques and give examples. Give a brief lecture summarizing the techniques for overcoming problems with the environment (listed in the content outline).

4. At the conclusion of the lesson, distribute Handout 11.1 for inclusion in Participant Reference Manual.

UNIT ELEVEN: CLASSROOM MANAGEMENT
LESSON 1 of 1: CLASSROOM MANAGEMENT

Content Outline

Estimated time: 60 minutes

I. Introduction (lecture, 10 minutes)

A. Environment's influence on instruction is illustrated by a simple model of the process of instructional communication. The environment may either change the instructional message before it reaches the learner, or affect the learner's ability to receive it. Figure 11.1

B. Two major kinds of environmental influences on instructional communication:

1. physical environment - the setting for the instruction

2. psychological environment - the learner's attitudes and dispositions towards the instruction or the setting

C. Summary of this lesson's objectives

II. Environmental Effects on Communication (guided discussion, 30 minutes)

A. Effects of physical environment on communication

Figure 11.2 *Lead class in guided discussion in which you call upon participants to first identify an important physical characteristic of instructional effectiveness. Some of the characteristics that should be introduced include: classroom size, classroom furnishings, classroom arrangement, lighting, acoustics, class size, time of day, length of class. If the discussion is slow in starting give the first example: (i.e., describe how poor acoustics can effect communication by either making it impossible to hear the message, or by making it so difficult that the trainee gets tired and stops paying attention.) Use Figure 11.2 to summarize the discussion by listing the identified environmental characteristics and their effects.*

B. Effects of the psychological environment on communication

Figure 11.3 *Continue the preceding discussion, calling upon the participants to describe how the psychological environment can effect instructional communication. Some of the points that should be considered include: teacher attitudes towards the class or the subject of instruction, trainee attitudes towards the teacher, and the subject of instruction, motivation and rewards for training, and the*

interpersonal relationships of the trainees with each other and the instructor. Summarize the discussion using Figure 11.3 on the overhead projector (or use the blackboard).

III. Techniques for Overcoming Problems with the Physical or Psychological Environment (guided discussion and lecture, 20 minutes)

Have participants suggest planning considerations and techniques for managing instruction. In your summary lecture cover any of the points below which may not come up in the discussion.

Figure 11.4

A. Things to consider in planning instruction:

1. Selection of instructional methods and media to accommodate the physical environment.
2. Development of rewards for motivating students.
3. Planning the teaching schedule to allow for breaks, questioning periods, etc.
4. Determining the degree of formality - informality you wish to maintain in the classroom.

B. Techniques for managing the class and maintaining attention:

Figure 11.5

1. Introduce the class by explaining what is to be taught and outlining the instruction. Explain how it meets the needs/interests/backgrounds of the learners.
2. Keep learners informed of progress through the instruction (i.e., "the second point that must be explained..., the last exercise for today...").
3. Keep attention focused on key instructional points through verbal directions or emphasis (i.e., "what's important here is that..."). Use media or graphic techniques to highlight points.
4. Maintain high levels of learner participation in the instruction.
    - a) frequent questions and exercises
    - b) use of instructional methods other than the lecture

5. Pace the instruction appropriately for that particular group of learners. Use a variety of instructional media and methods.
6. During lectures, move closer to the class and/or move around the room if attention is slipping. Stand closest to, or lecture at, those who appear to be falling asleep.
7. Counsel "problem" or disruptive learners outside of class.
8. Be fair and considerate to all members of the class.

Handout 11.1 — *Distribute Handout 11.1 for inclusion in Participant Reference Manual.*

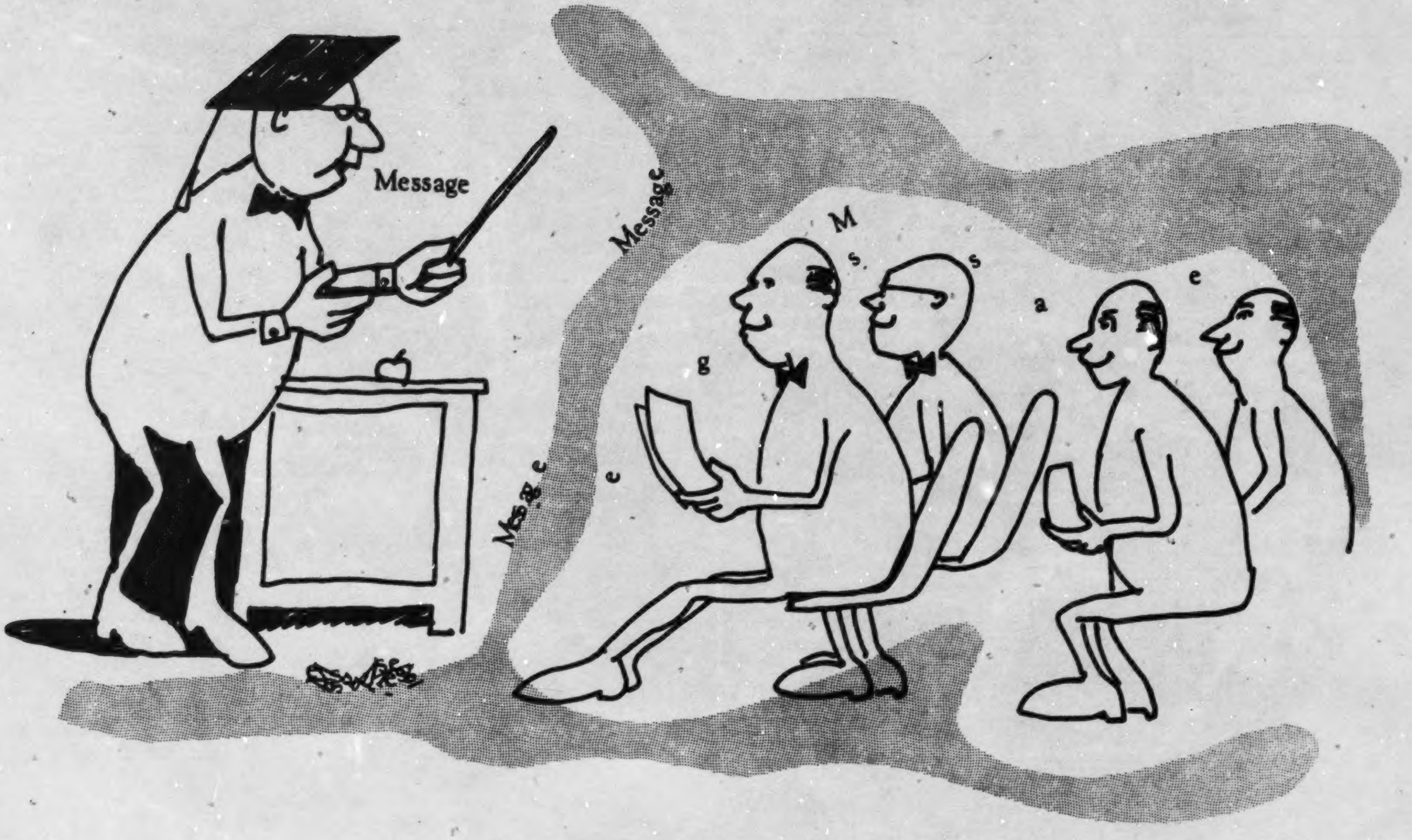

Message
Message
M
s
s
a
e
g
e
Messg e

Figure 11.1/ Environmental Influence

PHYSICAL ENVIRONMENT AND INSTRUCTION

Characteristic	Effect
–Poor Acoustics	–Can't hear instruction
	–Loss of attention

Figure 11.2/Physical Environment

PSYCHOLOGICAL ENVIRONMENT AND INSTRUCTION

Characteristic	Effect

Figure 11.3/Psychological Environment

CONSIDERATIONS WHEN PLANNING INSTRUCTION

- Selection of Methods and Media
- Rewards
- Class Schedule
- Degree of Formality

Figure 11.4/Planning Considerations

TECHNIQUES FOR MANAGING CLASS AND MAINTAINING ATTENTION

-Begin with overview

-Note progress

-Direct attention

-Maintain participation

-Appropriate pace and variety

-Move around classroom

-Counsel problem students

-Treat all students equally

Figure 11.5/Managing Techniques

UNIT ELEVEN: CLASSROOM MANAGEMENT
LESSON 1 of 1: CLASSROOM MANAGEMENT

Handout 11.1: Techniques for Overcoming Problems with the Physical or Psychological Environment

A. Things to consider in planning instruction:

1. Selection of instructional methods and media to accommodate the physical environment.
2. Development of rewards for motivating students.
3. Planning the teaching schedule to allow for breaks, questioning periods, etc.
4. Determining the degree of formality - informality you wish to maintain in the classroom.

B. Techniques for managing the class and maintaining attention.

1. Introduce the class by explaining what is to be taught and outlining the instruction. Explain how it meets the needs/interests/backgrounds of the learners.
2. Keep learners informed of progress through the instruction (i.e., "the second point that must be explained..., the last exercise for today...").
3. Keep attention focused on key instructional points through verbal directions or emphasis (i.e., "what's important here is that..."). Use media or graphic techniques to highlight points.
4. Maintain high levels of learner participation in the instruction.
   a) frequent questions and exercises
   b) use of instructional methods other than the lecture
5. Pace the instruction appropriately for that particular group of learners. Use a variety of instructional media and methods.
6. During lectures, move closer to the class and/or move around the room if attention is slipping. Stand closest to, or lecture at, those who appear to be falling asleep.
7. Counsel "problem" or disruptive learners outside of class.
8. Be fair and considerate to all members of the class.

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT TWELVE
DEVELOPMENT OF SECOND PRESENTATIONS

Estimated time for unit - 3 hours

Note: This unit is not subdivided into separate lessons.

Overview

The development of good teaching skills requires practice. In this unit participants have the opportunity to apply many of the skills they have learned throughout the workshop. Each participant defines the objectives, develops evaluation items, and designs the instruction and supporting figures for a fifteen minute lesson. These lessons will be presented and evaluated as part of the conduct of Unit Thirteen.

Entering Competencies

The unit requires participants to apply the concepts and skills gained throughout the whole workshop.

Objective

Behavior

By the conclusion of this unit, workshop participants will have defined an objective, designed evaluation items, planned the instruction (including the preparation of an Instructional Package Worksheet), and prepared a presentation on one lesson on a selected area of this workshop. Participants will choose a specific subject area from the list provided in the Unit Thirteen Lesson List. Each subject area has already been treated in the workshop and Unit Thirteen lessons are intended to summarize and review the workshop.

Conditions

Participants will work from their own notes and reference manuals during the time provided to prepare their lessons. All presentations will be delivered as part of Unit Thirteen's activities.

Acceptable Performance

Presentations should be based on sound principles of systematic instructional planning and practice. Participants should also be able to justify their instructional decisions. Finally, when delivered, the presentations should exhibit the characteristics of good teaching and public speaking.

Evaluation Activities

A presentation rating scale is to be used for evaluating the presentations. Copies of the participants' IPWs (especially the objective statements) and their evaluation items will be critiqued by the instructor. The evaluation items will be used as part of the workshop post-test to be given in Unit Fourteen.

Resources

Handout 12.1 Unit Thirteen Lesson List
12.2 Presentation Rating Scale

Participant Reference Manual
Instructional Package Worksheets and materials from previous lessons

Instructional Approach

Before giving this unit, review all information in Unit Thirteen "Workshop Summary". Decide how you will divide the lessons across participants.

As class begins, explain the nature and objectives of Unit Twelve. Remind participants of how the workshop has been specifically designed to prepare them for this activity.

Assign or have participants choose the specific lesson(s) they will prepare. For each lesson direct them to specify an objective and plan 15 minutes of instruction using the Instructional Package Worksheet to record their plans. Direct them also to develop three evaluation items for use in testing the achievement of their lesson's objective. (Explain that these items may be used in the workshop's post-test.) The completed Instructional Package Worksheet and the evaluation items are to be handed in to the instructor when the Unit Thirteen presentations begin.

Note that the participants have three hours to prepare their lessons and to practice their presentations. If possible, locate extra rooms or space of some kind for their practice sessions.

Assist participants as they prepare their lessons. However, allow them to make all of their own design decisions. For specific content or procedural questions refer them to relevant sections of the Training Manual. Try to reduce any anxiety about preparing and giving the lessons. Encourage them to prepare or use existing copies of transparencies and handouts in their presentations. Occasionally inform them of the time remaining for this unit and remind them to allow enough time to practice presentations. End the unit on schedule.

NOTE: If you are following the five-day schedule, you will assign this preparation activity for the fourth evening. The participants will have one additional hour at the beginning of the next morning to make any additional preparations before delivering their presentations.

UNIT TWELVE: DEVELOPMENT OF SECOND PRESENTATIONS

Handout 12.1: Unit Thirteen Lesson List

Unit Thirteen Lesson List

Use this form for identifying those Unit Thirteen lessons which will be delivered by workshop participants. A complete list of the required lessons is presented below in the order in which they should occur. Each lesson should consist of a ten- to fifteen-minute lecture followed by a five- to ten-minute feedback session on the successfulness of the preparation and presentation of that lesson. A total of five hours is allotted to Unit Thirteen which is enough time for twelve presentations. If you have more than twelve students, you will have to subdivide the lessons accordingly and allow more time for this unit. Lessons Six, Eight, and Ten are particularly suited to subdivision into more specific topic areas. If you have fewer than twelve workshop participants, you may either have them prepare several lessons in combination or give some of the lessons yourself. Certain lessons are more easily paired for one summary presentation than others. The following lessons can be presented within one 15-minute presentation: lessons Two and Three, Four and Five, Six and Seven, Eight and Nine, and Ten and Eleven.

See Unit Thirteen Support Materials for descriptions of these lessons.

Lesson Number	Title	Based On Material in Unit
(1)	The Systematic Approach to Instruction	One
(2)	Problem Analysis	Two
(3)	Task Analysis	Three
(4)	Defining Objectives	Four
(5)	Evaluation Techniques	Five
(6)	Teaching Techniques	Six
(7)	Rules for Organizing Instruction	Six
(8)	Instructional Methods	Six
(9)	Lesson Planning	Seven
(10)	Media Selection	Ten
(11)	IRIS	Ten
(12)	Classroom Management	Eleven

Handout 12.2: Presentation Rating Scale

Name of Presenter________________________________Topic____________________

Directions: The following are some important characteristics of good instructional presentations. Check the column on the right that best represents your impression of this presenter's performance on each characteristic. Do not complete the form until the presentation is over. It should only take a few minutes to complete this form. Remember that the purpose of this rating scale is to provide corrective feedback to the presenter.

	Excellent	Very Good	Adequate	Poor	Does not Apply
A. Delivery Techniques					
1. Obtained the attention of the audience at the start	____	____	____	____	____
2. Attempted to match the presentation to the audience's background and preparation	____	____	____	____	____
3. Projected warmth, friendliness, confidence, and interest in the subject	____	____	____	____	____
4. Talked with sufficient volume to reach all listeners.	____	____	____	____	____
5. Varied stress, intonation and pacing as appropriate	____	____	____	____	____
6. Used humor when appropriate	____	____	____	____	____
B. Composure					
7. Maintained relaxed posture during the presentation	____	____	____	____	____
8. Refrained from pacing or shuffling feet	____	____	____	____	____
9. Used no distracting mannerisms	____	____	____	____	____
C. Organization					
10. Began with a clear introduction, including purpose and overview	____	____	____	____	____
11. Provided clear and useful organization for material	____	____	____	____	____
12. Emphasized and/or repeated important points	____	____	____	____	____
13. Incorporated examples and illustrations	____	____	____	____	____
14. Allowed for audience feedback through questions and comments	____	____	____	____	____

Use the back of this form for any additional comments or suggestions you might wish to make.

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT THIRTEEN
WORKSHOP SUMMARY - Unit Summary

Estimated time for unit - 5 hours

Overview	This unit is intended as a review and summary of the basic instructional technology subjects covered in this workshop. It enables participants to reinforce their understanding of these subjects while providing an opportunity for them to practice their presentation skills. (The content, objectives, Instructional Package Worksheets, and support materials for teaching this unit are developed by workshop participants as part of Unit Twelve's activities.)
Entering Competencies	It is expected that no one will begin this unit without having achieved the objectives of all preceding units.
Summary of Objectives	This unit represents the culmination of Unit Twelve's objective.
Evaluation Activities	The Presentation Rating Scale will be completed by the participants to evaluate each presentation - see Unit Twelve Support Materials. The participants' Instructional Package Worksheets and evaluation items will be collected by the instructor when this unit begins. The instructor will critique each IPW [especially the objective(s)] and, if appropriate, the evaluation items will be incorporated within Unit Fourteen's Post-test. NOTE: Each participant lecture is to be fifteen minutes long followed by a ten-minute critique of the presentation.
Resources	Unit Twelve materials

Summary of Unit Activities

Lesson Title	Instructional Methods	Time	Support Materials
1) The Systematic Approach to Instruction	Lecture; Critique	25 min.	To be created by participants
2) Problem Analysis	Lecture; Critique	25 min.	"
3) Task Analysis	Lecture; Critique	25 min.	"
4) Defining Objectives	Lecture; Critique	25 min.	"
5) Evaluation Techniques	Lecture; Critique	25 min.	"
6) Teaching Techniques	Lecture; Critique	25 min.	"
7) Rules for Organizing Instruction	Lecture; Critique	25 min.	"
8) Instructional Methods	Lecture; Critique	25 min.	"
9) Lesson Planning	Lecture, Critique	25 min.	"
10) Media Selection	Lecture; Critique	25 min.	"
11) IRIS	Lecture; Critique	25 min.	"
12) Classroom Management	Lecture; Critique	25 min.	"

BASIC INSTRUCTIONAL TECHNOLOGY

UNIT FOURTEEN
EVALUATION AND CONCLUSION

Estimated time for unit - 1 hour 30 minutes

Note: This unit is not subdivided into separate lessons.

Overview

As the conclusion to the workshop, this unit provides participants with an opportunity to receive feedback on their understanding of the major subject areas. Participants are also asked to provide the instructor with feedback on the strengths and weaknesses of the workshop itself.

Entering Competencies

It is expected that everyone participating in this will have completed the workshop to this point.

Objectives

There are no learning objectives for this unit.

Evaluation Activities

The entire unit is an evaluation activity. It consists primarily of two exercises: the completion of a post-test on the content of the workshop and an evaluation of the workshop.

Resources

Handout 14.1 Workshop Post-test (to be developed by instructor)
14.2 Workshop Questionnaire

Instructional Approach

This unit should be approached as having two general purposes. The first is to gather information regarding both the extent of learning achieved by the participants and their opinions of the workshop itself. The second purpose is to provide closure to the workshop and answer any final questions which the participants may have.

1. Use the evaluation items created by the participants as part of Unit Twelve's activities to create a post-test. There should be some time between collection of the items at the end of Unit Twelve and the beginning of this Unit to organize these items into a test. You can list the items on a transparency or blackboard or have them typed and copied as a handout. As a back-up strategy and to insure coverage of workshop material, you will probably want to prepare your own list of

evaluation items for use if necessary.

2. Administer the test at the beginning of the unit. It will probably take about fifteen minutes for participants to complete the average (20 item) post-test. Have them exchange the completed tests and compare their responses. After ten minutes of peer review/discussion, answer questions and discuss the correct responses with all the participants.

3. Administer the Workshop Questionnaire. Have participants complete it anonymously. Ask them for their candid reactions and constructive suggestions for improving the workshop. This activity should take 15-20 minutes.

4. Hand out copies of any remaining instructional materials so that every participant has a complete reference manual. End the workshop with a discussion of how the Participant Reference Manuals can be used as an important resource as the participants go on to plan and deliver their own workshops and instructional activities. If it seems appropriate, you may also want to describe the nature and availability of the Advanced Workshop on Instructional Technology. Answer any final questions.

UNIT FOURTEEN: EVALUATION AND CONCLUSION
Handout 14.2: Workshop Questionnaire

Date ____________________

Workshop Title ____________________

Unit Title ____________________

Instructor ____________________

Check the most appropriate response to each of the following items.

1. Given my previous background in this subject, most of this material has been:
   - ☐ Too advanced
   - ☐ Too basic
   - ☐ Just right
2. I found that the instruction was paced:
   - ☐ Much too fast
   - ☐ A little too fast
   - ☐ Just right
   - ☐ A little too slow
   - ☐ Much too slow
3. I feel that this subject was:
   - ☐ Very important
   - ☐ Important
   - ☐ Somewhat unimportant
   - ☐ Irrelevant
4. I learned:
   - ☐ Quite a lot
   - ☐ Some things
   - ☐ Nothing
5. Generally, the instructional activities were:
   - ☐ Very clear
   - ☐ Adequate
   - ☐ Somewhat confusing
   - ☐ Confusing
6. Overall, I would rate this training activity as:
   - ☐ Excellent
   - ☐ Good
   - ☐ Fair
   - ☐ Poor

Use the back of this form to offer at least one specific comment on your reactions to or experience in this training activity. Thank you.

REFERENCES

Butler, E. C. Instructional systems development for vocational and technical training. Englewood Cliffs, NJ: Educational Technology, 1972.

Gagne, R. M. and Briggs, L. J. Principles of instructional design. New York: Holt, Rinehart, and Winston, 1974.

Gerlach, V. S. and Ely, D. P. Teaching and media: a systematic approach. Englewood Cliffs, NJ: Prentice-Hall, 1971.

Gronlund, N. E. Preparing criterion-referenced tests for classroom instruction. New York: Macmillan, 1973.

Gronlund, N. E. Stating behavioral objectives for classroom instruction. New York: Macmillan, 1970.

Harless, J. H. An ounce of analysis (is worth a pound of objectives). McLean, VA: Harless Performance Guild, Inc., 1975.

Kemp, J. E. Planning and producing audio-visual materials. New York: Crowell, 1975.

Mager, R. F. Preparing instructional objectives. Belmont, CA: Fearon Publishers, 1962.

Mager, R. F. and Beach, K. M., Jr. Developing vocational instruction. Belmont, CA: Fearon Publishers, 1967.

Mager, R. F. and Pipe, P. Analyzing performance problems (or 'you really oughta wanna'). Belmont, CA: Fearon Publishers, 1970.

Popham, W. J. Criterion-referenced measurement. Englewood Cliffs, NJ: Prentice-Hall, 1978.

Popham, W. J. and Baker, E. L. Systematic instruction. Englewood Cliffs, NJ: Prentice-Hall, 1970.